



**CLATRONIC**®  
INTERNATIONAL GMBH

**CTV 521/523/524**

# **Service Manual**

**Chassis 20.2 CTV**

## HINWEIS

CTV 521 ST/VT

CTV 523 ST/VT

CTV 524 ST/VT

Sehr geehrter Kunde,

das von Ihnen erworbene Fernsehgerät besitzt die Fähigkeit, Tonnormen verschiedener Länder umzusetzen.

In Einzelfällen kann es vorkommen, dass Sie die in Deutschland gültige Norm „BG“ manuell im Bildschirmmenü einstellen müssen.

Bitte beachten Sie, dass für andere Länder evtl. eine andere Tonnorm Gültigkeit hat. Bitte stellen Sie diese dann entsprechend ein.

Gehen Sie wie folgt vor:

- 1) Drücken Sie die Menü-Taste auf Ihrer Fernbedienung. Bewegen Sie sich nun mit der Programm-Taste nach unten und wählen Sie mit der Volume-Taste das Menü „System“ an.
- 2) Wählen Sie nun mit den Programm und Volume-Tasten auf der Fernbedienung den Unterpunkt „Handabstimmung“ an. Gehen Sie nun auf den Unterpunkt „Standard“. Durch Drücken der Volume Taste können Sie die Norm „BG“ auswählen.
- 3) Speichern Sie nun mit der OK-Taste.
- 4) Der Fernsehsender wird nun inklusive Ton wiedergegeben.  
Von diesem Programm aus haben Sie jetzt die Möglichkeit im Menü „Autom. Abstimmung“, den Sendersuchlauf für alle Sender erneut zu starten.
  - a) Alternativ können Sie auch jedes Programm einzeln auf den gewünschten Modus umstellen.  
Folgen Sie hierzu den Punkten 1-4.

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## SAFETY PRECAUTIONS

### GENERAL GUIDELINES

1. It is advised to insert an isolation transformer in the AC supply before servicing a hot chassis.
2. Potentials as high as 33KV are present when this receiver is in operation. Operation of the receiver without the rear cover involves the danger of a shock hazard from the receiver power supply. Servicing should not be attempted by any one who is not competent with the precautions necessary when working on the high voltage equipment. Always discharge the anode of the tube.
3. When servicing observe the original lead dress in the high voltage circuits. If a short circuit is found, replace all the parts which have been overheated or damaged by the short circuit.
4. always use the manufacturer's replacement safety components. The critical safety components marked with  $\nabla$  on the schematics diagrams should not be by other substitutes. Other substitute may create the electrical shock, fire or other hazards. Take attention to replace the spacers with the originals. Furthermore where a short circuit has occurred, replace those components that indicate evidence of overheating.
5. After servicing, see that all the protective devices such as insulation barriers, insulation papers, shields and isolation R-C combinations are correctly installed.
6. When the receiver is not being used for a long time of period of time, unplug the power cord from the AC outlet.
7. After servicing make the following leakage current checks to prevent the customer from being exposed to shock hazard.

### LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs of the plug.
2. Turn the receiver's power switch.
3. Measure the resistance value with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the receiver, such as screw

4. heads, aerials, connectors, control shafts etc. When the exposed metallic part a return path to the chassis the reading should be between 4Mohm and the 20Mohm. When the exposed metal does not have a return path to the chassis, the reading must be infinite.

### LEAKAGE CURRENT HOT CHECK

1. Plug the AC cord directly in to the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 2Kohm 10W resistor in series with an exposed metallic part on the receiver and an earth, such as a water pipe.
3. Use an AC voltmeter with high impedance to measure the potential across the resistor.
4. Check each exposed metallic part and check the voltage at the each point.
5. Reverse the AC plug at the outlet and repeat each of the above measurements.
6. The potential at the any point should not exceed 1.4 Vrms. In case a measurement is outside the limits specified, there is the possibility of a shock hazard, and the receiver should be repaired and rechecked before it is returned to the customer.

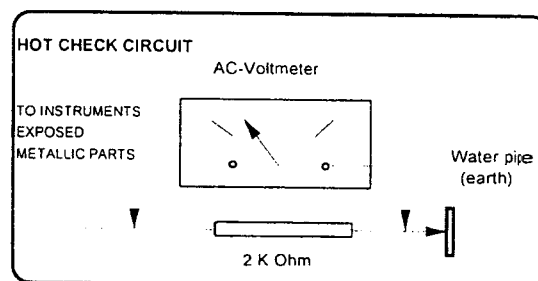


Figure 1

### X-RAY RADIATION WARNING

The primary source of X-ray radiation in this receiver is the picture tube. The chassis is specially constructed to limit X-ray radiation. For continued X-ray radiation protection, replace the tube with the same type of the original one.

### CAUTION

**SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR THE CARBON PAINTED ON THE CRT, AFTER REMOVAL OF THE ANODE CAP.**

## TECHNICAL SPECIFICATIONS AND THE FEATURES

**Power source:** 220-240V AC ,50-60Hz

**Power consumption:**

180 W	28"
205 W	29"
265 W	32"
215 W	33"

**Aerial impedance :** 75Ohm, Coaxial type

**Receiving system \*:**

PAL BG  
 PAL SECAM BG  
 PAL SECAM BG DK  
 PAL SECAM BG LL'  
 PAL I

**Receiving channels:**

VHF BAND I , CH2-4  
 VHF BAND III , CH5-12  
 CATV CHANNLES S1-S41  
 UHF BAND CH21-69

		<u>Focus Voltage</u>	<u>High Voltage</u>	<u>B+Supply Voltage</u>
CPT	: 28" 4:3	6.42 - 10.05 KV	27.5KV ±0.5KV	145 V
	28" P.FLAT 16:9	6.35 - 10.20 KV	29 KV±0.5KV	134 V
	28" S.FLAT 16:9	6.78 - 11.39 KV	29.5 KV±0.5KV	130 V
	29" P.FLAT	6.49 - 10.64 KV	29.5 KV±0.5KV	130 V
	29" S.FLAT	7.85 - 9.41 KV	29 KV±0.5KV	133 V
	32" P.FLAT	5.43 - 8.85 KV	29 KV±0.5KV	134 V
	32" S.FLAT	5.58 - 9.54 KV	29 KV±0.5KV	133 V
	33" 4:3	6.35 - 10.2 KV	29 KV±0.5KV	155 V

**Grid 2 voltage :** 0-1400V  
**Heater voltage :** 6.3±0.2Vrms

**Video/Audio Terminals :**

**AV1 IN** Video 1Vpp,75Ohm  
 Audio 0.5Vrms, >10Kohm  
 RGB

**AV1 OUT** Video 1Vpp,75Ohm  
 Audio 0.5Vrms, <1Kohm

**AV2 IN (RCA-OPTIONAL)** Video 1Vpp,75Ohm  
 Audio 0.5Vrms, >10Kohm

**Operating temperature :** 0-45 Degrees

**Safety** : IEC 65 /BS P2N

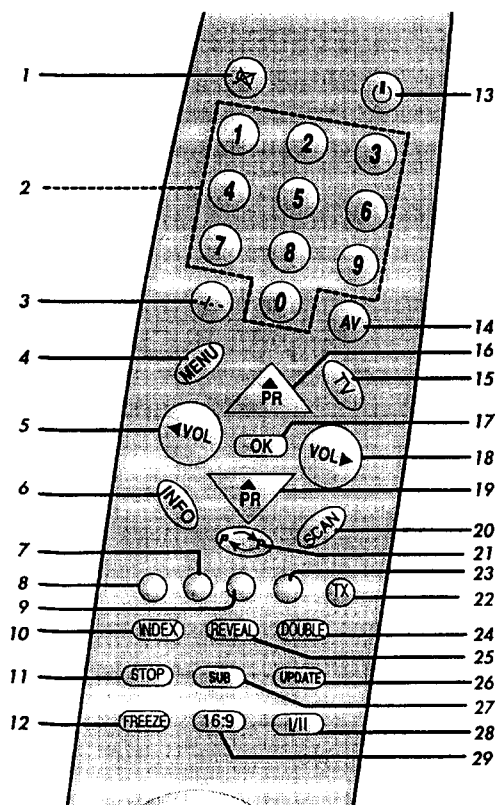
**X-Ray radiation** : ACC. IEC 65/BS P2N

- : TV set is produced to receive "one" of this colour and sound systems, which can be changed depending to the countries broadcasting system.

## SPECIAL FEATURES :

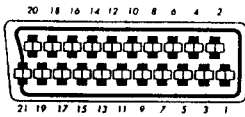
- Possibility to watch cable broadcasting.
- Capability to show all tuning, programme numbers, all processes automatically on the screen (On Screen Display).
- Provision of the best image on the station being watched with the sensitive station tuning feature (Manual Fine Tuning).
- Automatic switch off between 01 minute to 23 hours 59 minutes when programmed.
- Automatic switch on and off programmable to the desired period.
- No image accompanied automatic sound noise interruption in gaps corresponding to broadcasting breaks while searching for station.
- 100 programme memory.
- Infrared remote control with all the functions.
- Subwoofer (Optional)
- Virtual Dolby (Optional)
- Mosaic picture 12 for widescreen, 4 and 16 for 4:3 TV's.
- Two different Scart connection inlet providing connection of audio, video satellite receiver.
- Possibility to watch domestic and international rapid teletext broadcasts without any need for adding a separate module or connecting a stereo equipment.
- Direct channel selection feature which brings the desired broadcast to the screen either direct when channel number is given or by scanning 121 different channels forward and backward.
- Capability to make the processes easily with the developed menu system. Menu language selection in 8 different languages.
- Automatic switch-off within 5 minutes in case of interruption of the broadcast.
- S-VHS and CINCH inlets for S-Video connection.
- Program scanning, picture freeze and picture formatting features.
- No-tremble image quality with 100 Hz scanning frequency.

## REMOTE CONTROL:



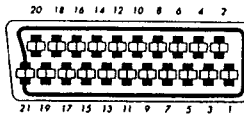
1. Temporary mute button (MUTE)
2. Number assignment buttons
3. Single digit, two digit programme selection button
4. Menu button
5. Volume adjustment decrease button
6. Display button (INFO)
7. Red teletext button
8. Yellow teletext button
9. Yellow teletext button
10. Index button (P100)
11. Stop button (STOP)
12. Picture stop button (FREEZE)
13. Temporary on-off button (STAND-BY)
14. Audio/Video button (AV)
15. Last programme selection button
16. Program winding button (P+)
17. Confirmation button (OK)
18. Volume tune increase button
19. Programme rewind button (P-)
20. Picture scan button (SCAN)
21. Previous programme button
22. Teletext selection button (teletext view button MIX on TV picture)
23. Blue teletext button
24. Page enlargement button (DOUBLE)
25. Question/response button (REVEAL)
26. Temporary TV image button (UPDATE)
27. Sub page button (SUB PAGE)
28. Stereo/Mono and language selection button
29. Picture format button

### Scart Scket (AV1) pin Connection



- |                       |                        |
|-----------------------|------------------------|
| 1. Right sound outlet | 12. Red-earth          |
| 2. Right sound inlet  | 13. Earth              |
| 3. Left sound outlet  | 14. Red                |
| 4. Sound earth        | 15. Blanking           |
| 5. Blue earth         | 16. Video-outlet earth |
| 6. Left sound inlet   | 17. Video-inlet earth  |
| 7. Blue               | 18. Video outlet       |
| 8. Keying             | 19. Video inlet        |
| 9. Green-earth        | 20. Socket earth       |
| 10. Green             |                        |

### Scart Scket 2 (AV2) pin Connection

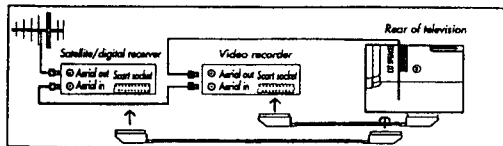


- |                       |                            |
|-----------------------|----------------------------|
| 1. Right sound outlet | 11. Video-outlet earth     |
| 2. Right sound inlet  | 12. Video-inlet earth      |
| 3. Left sound outlet  | 13. Composite video outlet |
| 4. Sound earth        | 14. Composite video inlet/ |
| 5. Earth              | 15. Socket earth           |
| 6. Left sound inlet   |                            |
| 7. Keying             |                            |
| 8. Earth              |                            |
| 9. Earth              |                            |
| 10. Earth             |                            |

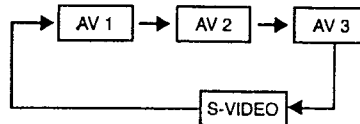
**Note 2 :** By means of scart socket from the external device supporting NTSC system you can obtain image in the position of AV1 or AV2. In this case "TINT" feature will be added on the picture menu.

On this feature, you can make the colour adjustment you want by using "VOL" / "VOL" keys on your command.

### TV, Video and satellite receiver connections



**Note 1 :** In case you connect Decoder to your TV from the Scart1 inlet and connect Video, DVD or VCD from Scart2 inlet and work at the same time, with the broadcast coming by means of Decoder to encoded state while watching broadcast in AV2 position your television will automatically pass from AV2 position to AV1 position.



**Note :** Use programme keys to get out of AV cycle.

### Note 3 :

You can record the device you connected from AV1, AV3 and S-VIDEO inlet to an external record device you will connect to the AV 2 socket of your TV. See the section for outlet to AV2 under the heading of other features.

### Note 4 :

In case of entry of MONO sound from scarts (L or left sound entry), bring the sound type to DUAL 1 position to hear the sound from both speakers.

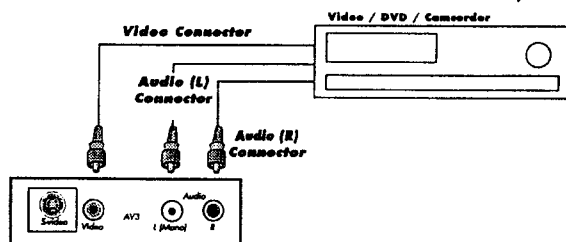
### Note 5 :

Devices which automatically pass to AV, also determine the screen mode to become 4:3 or 16:9.

### Note 6 :

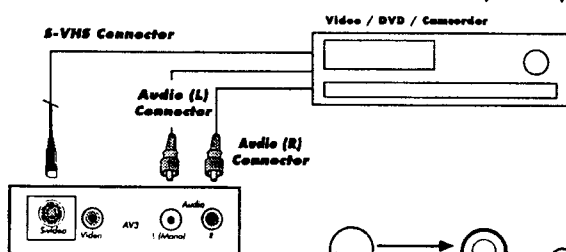
Connection cables are not given together with the television.

### External device connection from AV terminals (AV3)



You can connect your devices like video, DVD player, camera from RCA type connector inlets of your television. In this case, bring your television to "AV3" position by pressing the "AV" key on the remote control.

### Connection of device with S-VHS connector (AV3-S)



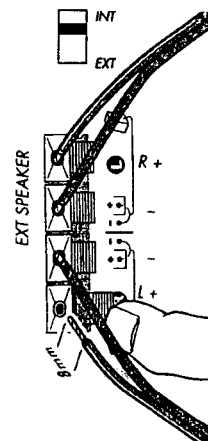
Connection of device with S-VHS connector (AV3-S) Left (R) - sound entry CINCH connector - Left (L) "MONO inlet" - S-VHS connector - S-VHS Video/Camera You can connect your devices like video-player or camera which have S-VHS feature to your television as on the left. In this case bring the television to "S-VIDEO" position by pressing the "AV" key. You can watch your video cassette in S-VHS format on your television in clear picture quality with a video of S-VHS feature.

### Headphone connection (optional)

Connect a headphone with a headphone socket, which has an impedance of between 8 and 600 Ohm and is of the 3,5 mm jack type. Insert the plug into the headphone socket. In the Sound menu select Headphone to adjust the sound adjustments for headphone.

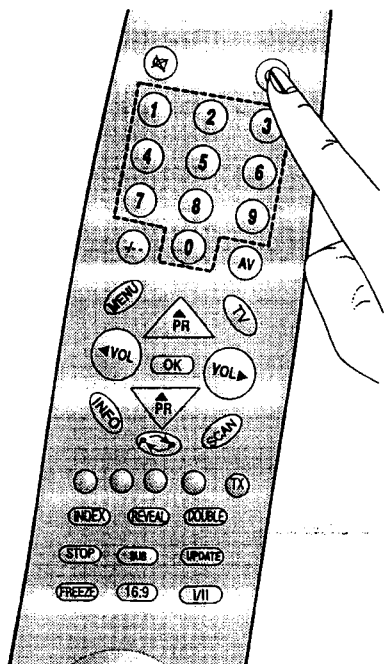
### External loudspeakers (optional)

You can replace the left and right internal loudspeakers of your set by two extra loudspeakers, 8 Ohm each. Connect the loudspeakers to the connector clips at the back of the TV. Push the connector clip down and insert the ends of the wires into the openings: the negative wires to the black connector clips, the positive wires (the one with a black line) to the red connector clips. Do not insert the wires too far. Connect the front left loudspeaker to L and the front right loudspeaker to R. Put the loudspeaker switch on the back in the EXT position. The internal right and left loudspeakers of your TV are now switched off.





## Using your television



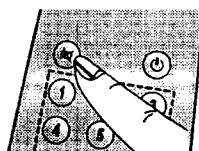
### Temporary switch-off (STAND-BY)

When you press the red "STAND-BY (Temporary switch-off)" key on the right upper side of your remote control device, while your TV is in working condition, the image and sound of your television will be cut off. In order to turn on your television again, press any number key or "PR▼"/"PR▲" keys.

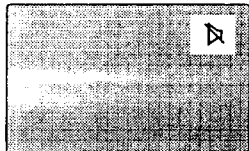
### Attention!

If you are not going to use your television for a long time, turn off from on-off (network) key. When you use your television continually with the "temporary switch-off" key, the process of cleansing magnetic area does not realise. For this reason colouring may arise on the screen. In this case switch off your television from the on-off (network) key. Turn on your television again after it cools down.

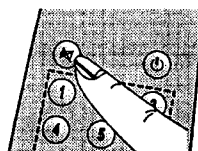
### Temporary sound interruption



1 When you want to interrupt the sound of your television for a temporary period, press "MUTE" key.



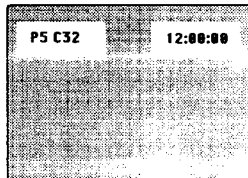
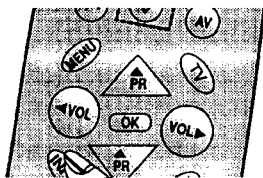
2 In this case the sign "🔇" will appear.



3 When you press the same key for the second time, the sound will be opened again.

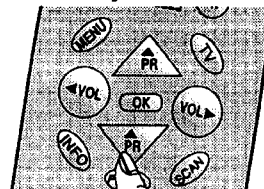
For information: While on mute position, volume decreases when you press "◀VOL" key, when you press "VOL▶" key, Mute position cancels.

### Display key



When you press "INFO" key, the number of programme you have been watching and the name of the programme (if the name of the programme is not given, the channel number) will appear on the top left corner of the screen and the time will appear on the right top corner if the broadcast you have been watching is with teletext. After a short while, the image is automatically deleted. When pressed for the second time, programme schedule appears on the screen.

### SWAP key

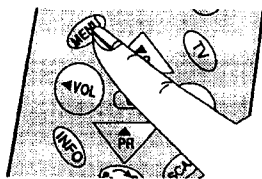


When you press "P↺P" key, whichever programme you watched before the one you are currently watching, it comes to the screen. When you press this button again, the programme you were watching previously comes to the screen.

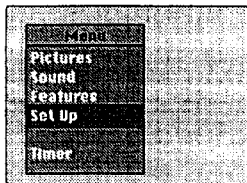
## Broadcast tuning and recording to memory

- With the ATS (Automatic Tuning System) feature of your television, you can automatically search for TV broadcasts, find and record to the memory. Or you can enter channel numbers, thus find the broadcasts.

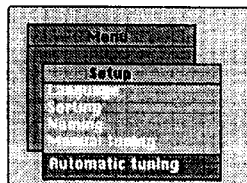
### A. Automatic search of TV channels and recording to memory



Bring the menu to the screen by pressing the "MENU" key on the remote control.



1 Then press "PRV" key, make channel tuning line blue. Press "VOL▶" key. Channel tuning menu will come to the screen.

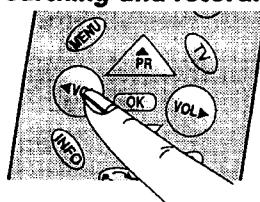


2 By pressing the "PRV" key, turning the automatic tuning line into blue, press "VOL▶" key. Automatic channel tuning menu will come to the screen. By using "VOL▶/VOL◀" keys, choosing Turkey against country, press "OK" key.



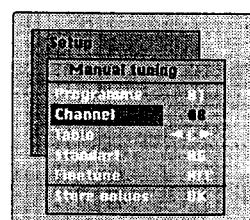
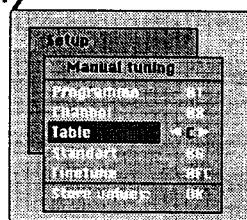
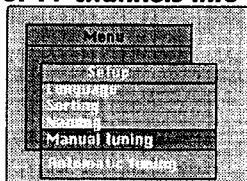
3 Channels will automatically scanned and channels on which broadcast is found will be started to be taken into memory from the First programme. At that moment it will display completed channels on the screen as percentage. When the process is completed Channel Tuning menu is deleted. In order to stop the process at any moment, press "TV" key. You can record programme numbers taken into memory, any channel you want as stated in Programme Listing section. For those required to be fine tuned among those taken into memory, tune as told in Fine Tuning section and record to the memory. In order to cancel those unnecessary due to frequency pollution (especially in areas where Tv receivers are intense), see Programme delete section.

### B. Searching and recording of TV channels into memory



Press the "MENU" key on your remote control. By using "PR" key turn the channel tuning keys into blue. Bring the Channel tuning menu on your screen by pressing "VOL▶".

By using "PRV" key, making the Manual tuning line to blue, pressing the "VOL▶" key, bring the Manual tuning menu on your screen.



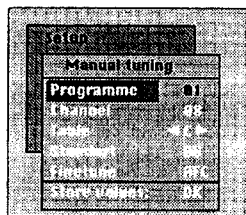
With the "PRV"/"PR▲" keys of your remote control, make Channel type line into blue. With the "VOL▶" key choose "S" for cable channels, "C" for the broadcast received from antenna. Again proceed to Channel No. key with the "PRV" key.

#### A. if you know channel numbers:

Enter the channel number by using numbering keys.

#### B. if you don't know the channel number:

Scan the channel numbers in an increasing order by pressing "VOL▶" on your remote control, in a decreasing order by pressing "VOL◀". When you meet the number of broadcast receiving channel the image will appear on the screen. If the broadcast on the screen is not in the desired quality, continue searching for channel.



#### Recording to the memory:

After finding the desired station, make the Programme line blue with the "PRV" key. By using the numbering keys, enter the programme number which you want to take your current channel into memory. You can also select the programme number by using "VOL▶/VOL◀" keys.

After having selected the programme number press "OK" key. When the letters on the record to memory line turn into yellow in an order and then again become white, the broadcast will be taken into memory with the programme number you have chosen.

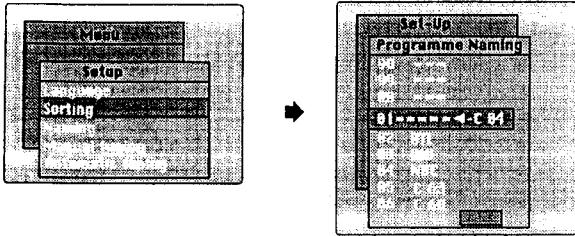
You can record other channels as well into memory by searching in the same way. If you would like to exit Channel tuning menu for some reason, press "TV" key.

### Fine Tuning

If the current channel requires fine tuning make the Fine Tuning line blue by entering the Manual tuning menu from the Channel Tuning menu using "PR▼" key. By using the "VOL▶"/"VOL◀" keys on your command, adjust the broadcast seen on the screen to the desired quality. Under normal conditions you will not require fine tuning. (OFK is running.) AFC circuits of your television will be locked to the desired station. However in case TV transmitters do not function in the standards, you may require that. When you make fine tuning AFC will get out of circuit. The operation to take the tuning you have made to memory is as above.

### Programme Schedule

#### Deletion/replacement of broadcast taken into memory:



By entering the channel Tuning sub-menu from the Menu, make the Programme listing line in blue colour. Press "VOL▶" key, enter Features menu.

Move towards the programme number you want to delete with the "PR▼"/"PR▲" keys. After the programme you have selected comes to the screen, press the "VOL▶" key. Delete and Red signs will appear in the lower part of the screen.

### Deletion:

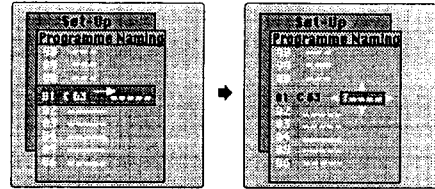
If you press the red key on the remote control, the channel on the selected programme will be deleted and the channels taken into memory in the following programmes will pass onto previous programme numbers.

### Replacement:

Choose the channel taken into memory in the programme you have chosen by using "PR"/"PR" keys. Press "VOL" key, bring the desired programme number opposite to it with "PR"/"PR" keys. Press "VOL" key. The broadcast is transferred to the desired programme number. Channels taken into memory in the following programmes will pass into the following programme number.

### Naming of programmes:

You can name the programme or programmes you want in five characters. By entering Channel Tuning sub menu from the menu, make the naming line in blue colour with the "PR" key. Press "VOL" key, enter Features menu.



Select the programme you want to name or change the given name with "PR▼"/"PR▲" keys. Press "VOL▶" key.

Select the letter or number by using "PR" and "PR" keys. In order to move to the following/previous digit, use "VOL▶"/"VOL◀" keys. After having entered all the characters, record the name you have written into memory by pressing the "OK" key.

Repeat the above procedures to write name in other programmes. If you want to exit the menu before finishing the process for some reason, press "MENU" key.

**Note:** If no name is given to the programme channel number of 0 programme will be written automatically.

### Volume tuning

You can make volume level tuning by using "VOL▶"/"VOL◀" keys on your command when there is no menu on the screen or by using "▶◀◀" keys on the front panel of your Tv. Press "MENU" key. Make the volume line blue with the "PR" key, press "VOL▶" key. Volume tuning menu will come to the screen.

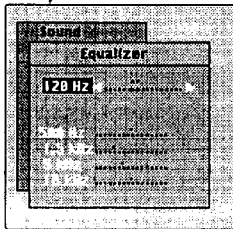
**Balance adjustment:** In order to adjust the volume balance between the left and right earphones, make the Balance line blue by using "PR▼" key. Make the balance adjustment by using "VOL▶"/"VOL◀" keys.

**Subwoofer:** (For the TVs with this feature). In order to tune the subwoofer speaker volume level make the Subwoofer line blue by using "PR▼" key. Make level adjustment by using "VOL▶"/"VOL◀" keys.

**Virtual Dolby:** (For the TVs with this feature). DVD or video cassette recorded with Virtual Dolby, Dolby Pro Logic Sound System enables you to listen with two speakers under the influence of Dolby Pro Logic.

Manufactured under license from Dolby Laboratories.

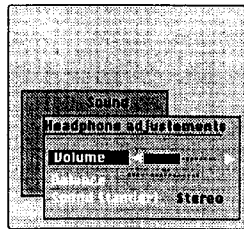
® "Dolby" and the double-D symbol are trademarks of Dolby Laboratories.



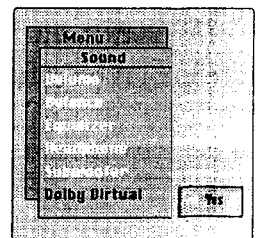
**Equalizer:** Make the Equalizer line blue, press "VOL▶" key.

Equalizer menu will appear on the screen. Choose the frequency band you want to tune with the "PR▼"/"PR▲" keys. Adjust the chosen frequency level with the keys of "VOL▶"/"VOL◀". Tuning levels are automatically taken into the memory.

**Note:** If this feature is chosen in TVs with virtual Dolby feature, Equalizer menu can not be entered



**Headphone:** Make the headphone line blue, press "VOL▶" key. headphone tuning menu will appear on the screen. You can use the functions here when you insert headphone in the properties suitable with the headphone outlet of your TV. You can make tuning selection with "PR▼"/"PR▲" keys, adjust the level with the "VOL▶"/"VOL◀" keys. If the broadcast you watch in the sound standard is stereo you can listen by selecting mono/stereo, is it is in two different languages you can listen with Dual I / Dual II selection.



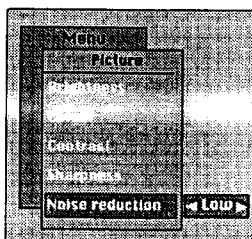
**NOTE:** Your television has the feature to receive Analogue stereo (A2) broadcast.

If the broadcast you have been watching is stereo the STEREO sign will appear on the screen.

If the stereo broadcasting is bad or you want to listen as mono, press the "I/II" key on the remote control. Organisations making stereo broadcast can make broadcasting in two different languages instead of stereo. (DUAL I/II feature). In such broadcasts, you can listen to one of these languages as mono from both speakers. To choose language, press "I/II" key on remote control.

### Image tuning

Press "MENU" key, then "VOL▶" key when the Picture line is blue. Picture tuning menu will appear on the screen. You can make tuning selection by using "PR▼"/"PR▲" keys, adjust levels with "VOL▶"/"VOL◀" keys. You can change picture brightness, colour intensity, contrast and sharpness levels depending on your choice. Besides, with the help of noise reduction feature of your Tv you can decrease picture failures to arise for various reasons under options depending on its strength.



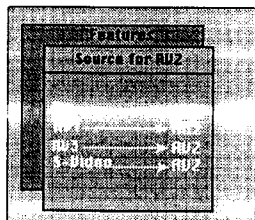
### Outlet to AV2

You can choose the exit to the second socket in the rear of your television. The ease of utilisation of this is to be able to record to a device you will connect to a second Start from a different inlet while watching broadcast from a different inlet or the ability to send picture and sound information.

TV television broadcast.

Picture and sound information coming from the device connected from AV1 first start.

Picture coming from the device connected from AV3 inlet and sound information connected from CINCH connectors. (for TVs with AV3 inlet) Picture coming from the device connected from S-Video S-VHS inlet sound information connected from CINCH Connectors.



### Other features:

Press "MENU" key then "VOL▶" key when Features line is blue. Features tuning menu will appear on the screen.

### Child lock

If you want to activate Child lock by pressing "VOL▶" key choose Yes position. In this case your television will not be worked from the keys on the front panel. It can only be worked with remote control. If you want to cancel child lock, choose No position.

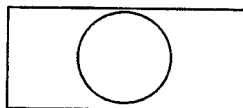
### Automatic volume control (AVC)

Sound qualities and levels of broadcasting institutions are different. This is felt when volume level in once channel is high and low in the other during programme transitions or when advertisement broadcast starts.

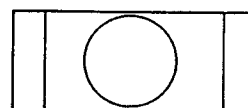
If you want to activate AVC by pressing "VOL▶" key, choose Yes position.

Since activating AVC effects the sound quality in film and music broadcasts, Yes position is not taken into memory.

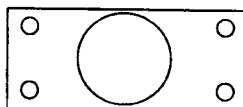
### Picture format (Optional)



**16:9** The set will automatically switch over to the 16:9 format when it detects a 16:9 format from scart inputs. However, you can also switch the format yourself.



**4:3** Conventional 4:3 picture format. It can be enlarged by selecting 16:9 format.



**Letter Box** This mode is usefull when watching video

Clips, some film formats and Pal-Plus Format. If you can't see the subtitle supplied by an external appliance at the bottom of the screen, especially when watching 4:3 picture in Letter Box format, press MIX button.

#### Menu language

Press **"MENU"** key. Make the Language line blue with the **"PR▼"** key, press **"VOL▶"** key. Language selection menu will appear on the screen. You can choose one of the languages of English, German, French, Turkish, Spanish, Italian, Swedish, Flemish by using **"PR▼"/"PR▲"** keys.

#### Automatic switch off-on

You can switch off your television automatically in the end of the period you will give, and again switch on automatically in the end of the period you will give. Press **"MENU"** key. Make the Timer line blue with the **"PR"** key, press **"VOL▶"** key. Timer menu will appear on the screen. Periods are given in hours and minutes. If the period you will give is less than an hour, make the time entry 00. For automatic switch-off choose Automatic switch-off from Timer menu. Enter the hour and minute by using the numbering keys of remote control, exit menu. To see the remaining period at any time, enter this menu. For automatic switch-on choose Automatic switch-on from the Timer menu. The procedure to be made is as told in automatic switch-off.

To cancel the entered period, press the Red key on remote control.

**Note:** If you switch off your television from the network key, the periods you have given for automatic on-off will be cancelled.

#### Picture format

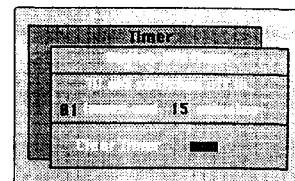
Press **"16:9"** key on remote control. Picture Format menu will appear on the screen. You can choose the format you want with the **"VOL▶"** key.

In Normal the picture format of your television is 4:3.

Narrow is for viewing in 16:9 format.

Long is for placing the picture within screen framework in case of receiving 4:3 broadcast in Letter-box format.

**Note:** When programme is changed, picture format becomes Normal (4:3).



#### Picture freeze

When you press **"FREEZE"** key on your remote control, the picture on the screen becomes fixed. To get out of the position, press the same key again.

#### Picture scan

You can watch the first four or sixteen programmes from the programme you have been watching, on the screen within frames. Press **"SCAN"** key on your command for this. The programme you are watching and the following three programmes will be scanned in intervals on the screen in four different frames. To view the desired one from these programmes, press **"SCAN"**, **"TV"** or **"OK"** during scanning. The programme you chose will appear on the screen. By pressing **"PR▼"** key during scanning, you can make the number of scanned programs sixteen. To exit, press **"SCAN"** key.

**Note:** In widescreen TVs only twelve scanning is made.

#### Viewing desired programme

When you press the **"INFO"** key on your remote control twice consecutively, bring the Info headed programme schedule to the screen. When you move onto the programme you are willing to watch with the keys of **"PR▼"/"PR▲"**, the image of that programme will appear on the screen. To delete the schedule from the screen, press **"INFO"** or **"TV"** key.

### Special Teletext Functions

#### P100 (Index / info key)

To select the index page, press this key.

---

#### Sub page key (SUB)

In case the teletext broadcasting institute broadcasts the sub pages of an teletext page, you can move to sub pages by using **"SUB"** key. In this case, **"P\*\*\*\*/\*\*\*\*\*"** is seen on the lowest line.

Enter the number of the sub page you want by using the numbering keys. You can exit the sub page by pressing the same key again.

---

#### Page enlargement key (DOUB)

You can view the upper half of the teletext page by using this key. Press the same key again to see the lower part of the same page as enlarged. When you press the **"DOUB"** key for the third time page will return to its normal size.

---

#### Question reply key (REV)

Sometimes a teletext page includes a hidden reply like a game or puzzle. To disclose the hidden reply, press **"REV"** key.

---

#### Stop key (STOP)

Some information are arranged as more than one page by the publishing institution, published as automatically converted. For example, in a letter comprised of four pages, pages are displayed on the screen as 1/4, 2/4, 3/4, 4/4. To look at one of these pages for longer press **"STOP"** key.

When you press the same key again, it continues.

## Teletext display key on TV picture (MIX)

By pressing "TX" key, you can view teletext information and TV broadcast on each other and together. Thus, you can follow the teletext broadcast of that channel while on TV broadcast. To return to teletext broadcast, press "TX" again, to return to TV broadcast press "TV" key.

## Temporary TV display key (UPDATE)

It is for you to wait for the searching of the page by passing on to the television display when the page you want is searched on teletext broadcast. While searching for the page for which you want teletext, you can change to television display by pressing "UPDATE" key. When the desired page is found, the number of that page appears on the screen.

## Fastext position

Coloured keys on remote control device are for fastext feature. When you choose any page, headings on various subjects could have been written in four different colours or in coloured frames (red, green, yellow and blue). By pressing the key for the related colour on remote control device, you can reach the desired subject without waiting.

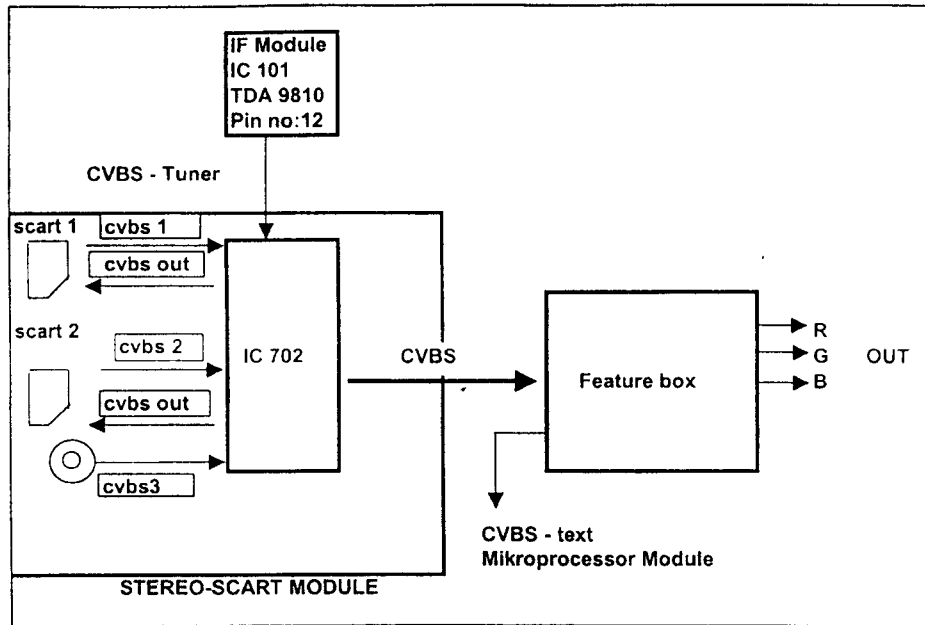
**Note:** Fastext feature is not available in all teletext broadcasts. Whether it will be published or not is determined by the institution making the broadcast.

## SERVICE TIPS

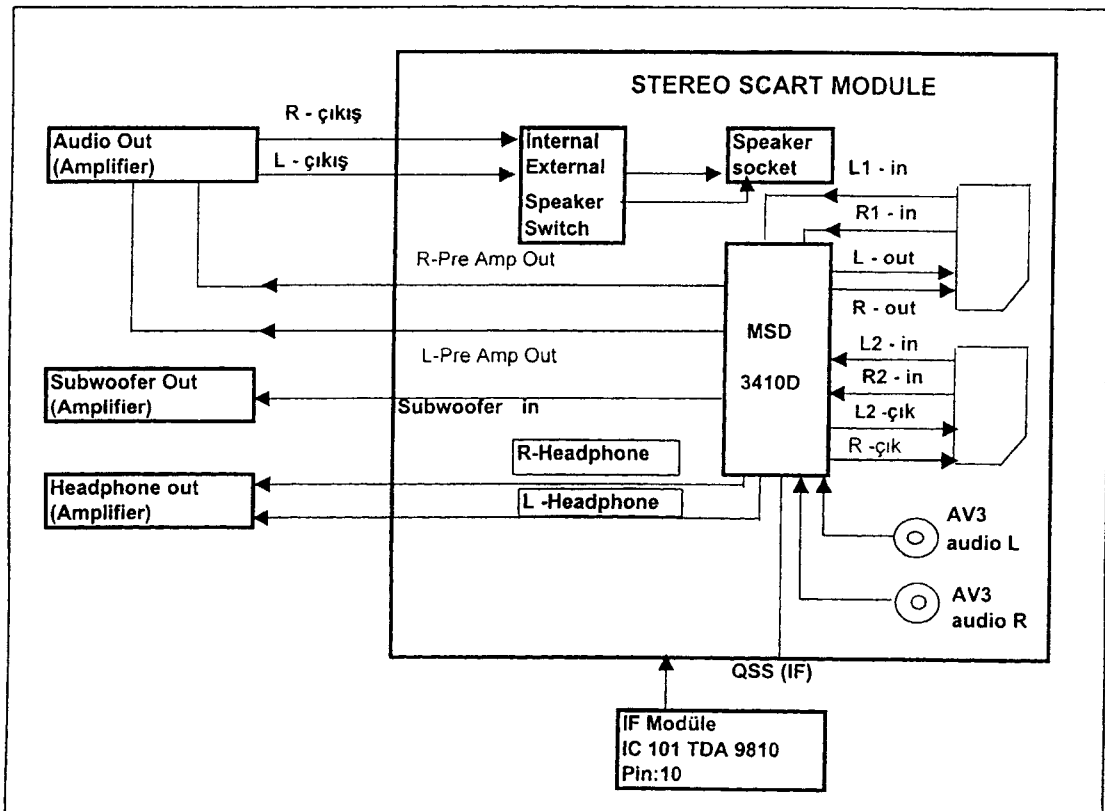
BEFORE CALLING FOR SERVICE  
HAVE YOU CHECKED (✓) THE  
FOLLOWING CHERT ON SYMPTOMS  
AND SOLUTIONS?

Symptoms	Solutions									
	Check if on/off switch is "on"	Try a different channel, if OK, probably station trouble	Check aerial connections on back of set	Check aerial for broken wires	Re orientate aerial	Probably local interference, such as an appliance	Adjust fine tuning control	Adjust brightness control	Adjust contrast control	Check if station is broadcasting colour
No picture, no sound	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Poor sound, picture OK	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Poor Picture, sound OK	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Weak picture	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Blurred picture	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Double image	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lines in picture	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Distorted picture	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Weak reception on some channels	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Horizontal bars	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Picture rolls vertically	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Poor colour	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
No colour	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Remote control not working	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
TV does not accept any command	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Teletext rolling up/down	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

## VIDEO BLOCK DIAGRAM



## AUDIO BLOCK DIAGRAM

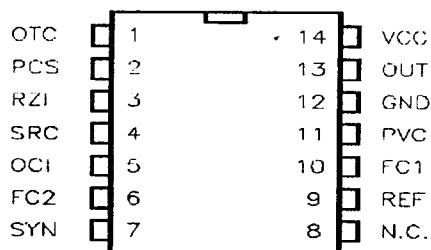


## TDA 16846

## Controller For Switch Mode Power Supplies

### Description

The TDA16846 is optimized to control free running or fixed frequency flyback converters with or without Power Factor Correction (Current Pump). To provide low power consumption at light loads, this device reduces the switching frequency continuously with load, towards an adjustable minimum (e.g. 20kHz in standby mode). Additionally, the start up current is very low. To avoid switching stresses of the power devices, the power transistor is always switched on at minimum voltage. A special circuit is implemented to avoid jitter. The device has several protection functions: VCC over- and undervoltage, mains undervoltage, current limiting and 2 free usable fault comparators. Regulation can be done by using the internal error amplifier or an opto coupler feedback (additional input). The out-put driver is ideally suited for driving a power MOSFET, but it can also be used for a bipolar transistor. Fixed frequency and synchronized operation are also possible.



### Pin Description

Pin	Symbol	Function
1	OTC	Off Time Circuit
2	PCS	Primary Current Simulation
3	RZI	Regulation and Zero Crossing Input
4	SRC	Soft-Start and Regulation Capacitor
5	OCI	Opto Coupler Input
6	FC2	Fault Comparator 2
7	SYN	Synchronization Input
8		N. C.
9	REF	Reference Voltage and Current
10	FC1	Fault Comparator 1
11	PVC	Primary Voltage Check
12	GND	Ground
13	OUT	Output
14	VCC	Supply Voltage

### Absolute maximum ratings

Parameter	Symbol	Min	Max	Unit	Remark
Supply Voltage at Pin 14	VCC	-0.3	17	V	
Voltage at Pin 1, 4, 5, 6, 7, 9, 10		-0.3	6	V	
Voltage at Pin 2, 8, 11		-0.3	17	V	
Voltage at Pin 3	RZI		6	V	
Current into Pin 3		-10		mA	V3 < -0.3V
Current into Pin 9	REF	-1		mA	
Current into Pin 13	OUT	-100	100	mA	V13 > VCC V13 < 0 V
ESD Protection				kV	MIL STD 883C method 3015.6, 100pF, 1500Ω
Operating Ambient Temperature	T <sub>A</sub>	0	70	°C	
Storage Temperature	T <sub>stg</sub>	-65	125	°C	
Operating Junction Temperature	T <sub>J</sub>		125	°C	
Thermal Resistance Junction-Ambient	R <sub>thJA</sub>			K/W	P-DIP-14-3
Soldering Temperature			260	°C	
Soldering Time			10	s	

All voltages listed are referenced to ground (0V, V<sub>SS</sub>) except where noted.



## STV9379FA

## Vertical Deflection Booster

- POWER AMPLIFIER
- THERMAL PROTECTION
- OUTPUT CURRENT UP TO 2.6A<sub>PP</sub>
- FLYBACK VOLTAGE UP TO 90V (on Pin 5)
- SUITABLE FOR DC COUPLING APPLICATION
- EXTERNAL FLYBACK SUPPLY

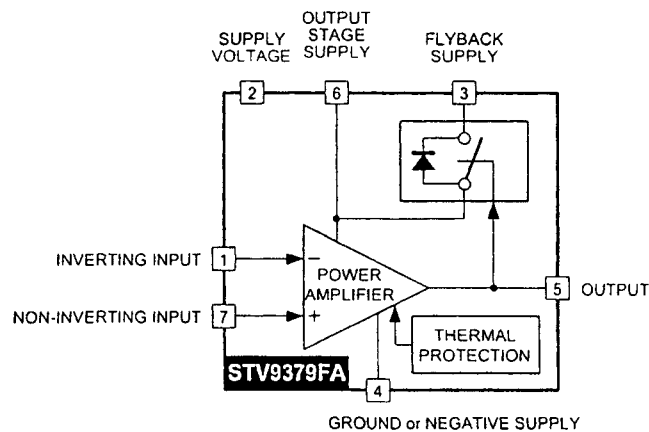
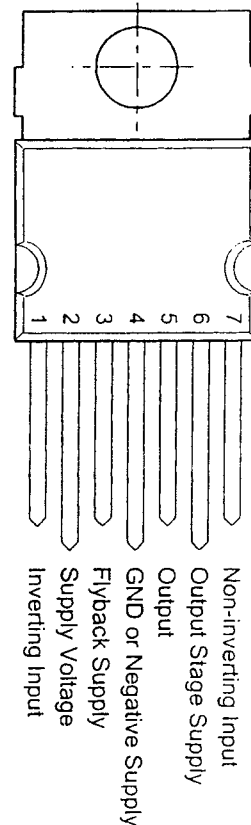
### DESCRIPTION

Designed for monitors and high performance TVs, the STV9379FA vertical deflection booster can handle flyback voltage up to 90V. Further to this, it is possible to have a flyback voltage which is more than the double of the supply (Pin 2). This allows to decrease the power consumption, or to decrease the flyback time for a given supply voltage.

The STV9379FA operates with supplies up to 42V and provides up to 2.6A<sub>PP</sub> output current to drive the yoke.

The STV9379FA is offered in HEPTAWATT package.

### PIN CONNECTIONS



### BLOCK DIAGRAM

# TDA9810

## Multistandard VIF-PLL with QSS-IF and AM demodulator

### FEATURES

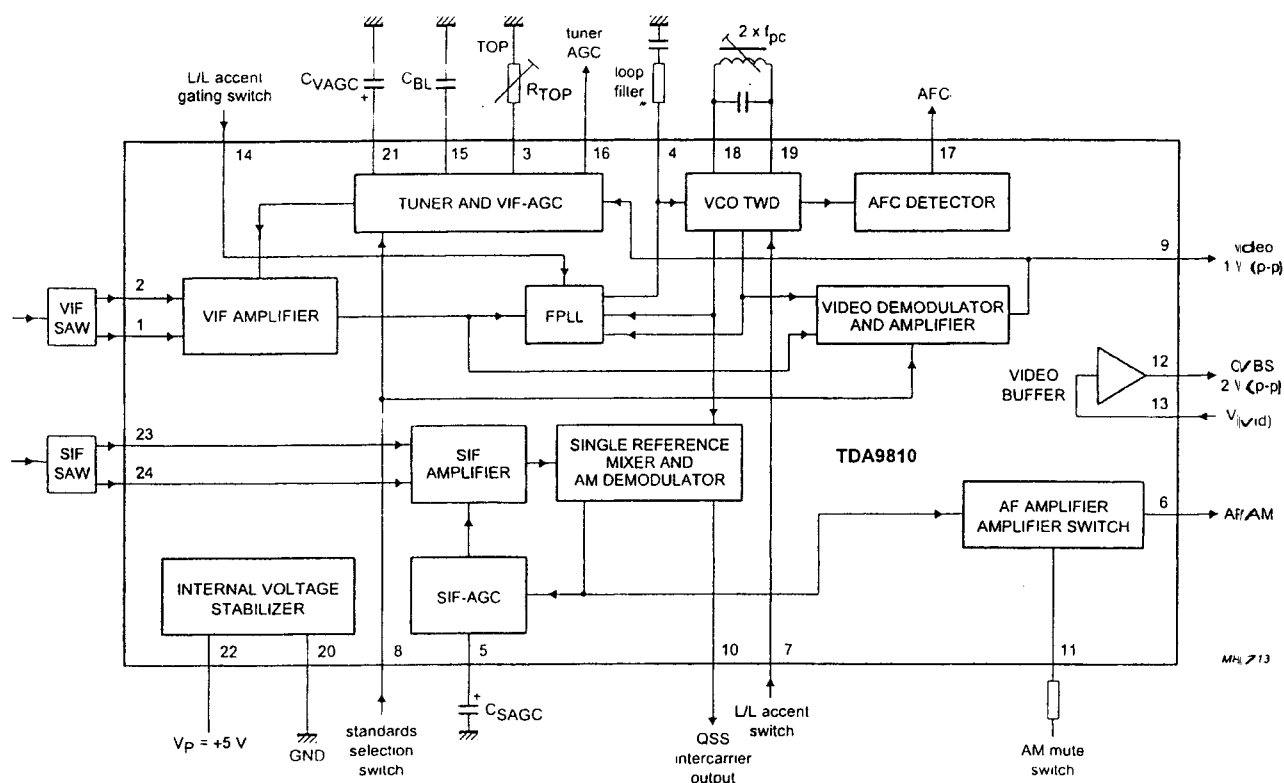
- 5 V supply voltage
- Gain controlled wide band Video Intermediate Frequency (VIF)-amplifier (AC-coupled)
- True synchronous demodulation with active carrier regeneration (very linear demodulation, good intermodulation figures, reduced harmonics, excellent pulse response)
- Gated phase detector for L/L accent standard; robustness for over-modulation until 105%
- Voltage Controlled Oscillator (VCO) frequency switchable between L and L accent (alignment external) picture carrier frequency
- Separate video amplifier for sound trap buffering with high video bandwidth
- VIF Automatic Gain Control (AGC) detector for gain control, operating as peak sync detector for B/G (optional external AGC) and peak white detector for L; signal controlled reaction time for L

- Tuner AGC with adjustable TakeOver Point (TOP)
- AFC detector without extra reference circuit
- SIF-input for single reference Quasi Split Sound (QSS) mode (Phase Locked Loop (PLL) controlled); Sound Intermediate Frequency (SIF) AGC detector for gain controlled SIF amplifier; single reference QSS mixer able to operate in high performance single reference QSS mode
- AM demodulator without extra reference circuit
- AM mute (especially for NICAM)
- Stabilizer circuit for ripple rejection and to achieve constant output signals.

### GENERAL DESCRIPTION

The TDA9810 is an integrated circuit for multistandard vision IF signal processing and sound AM demodulation, with single reference QSS-IF in TV and VCR sets.

### BLOCK DIAGRAM

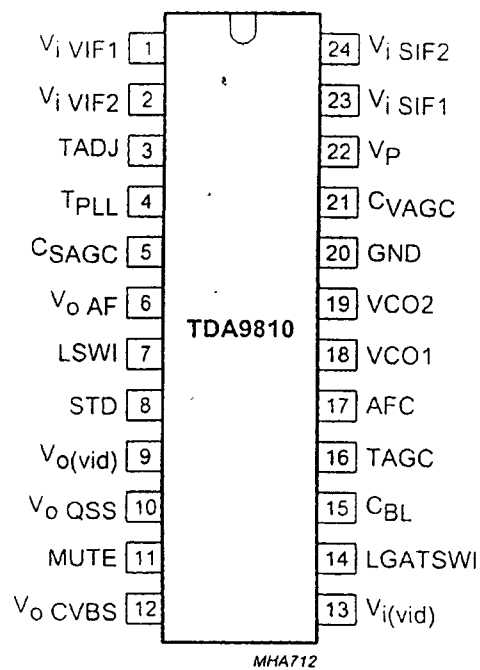


# TDA9810

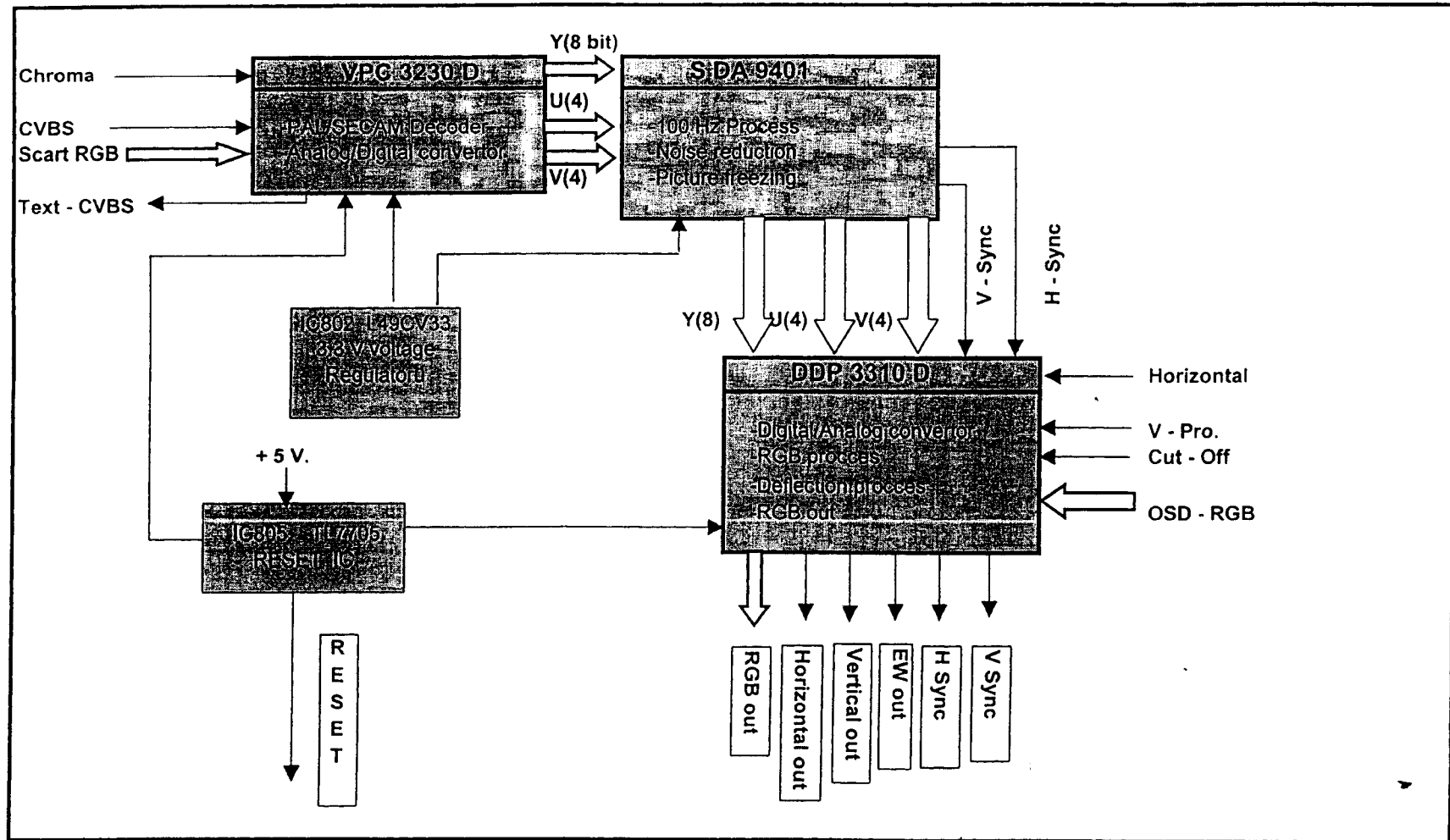
## PINNING

SYMBOL	PIN	DESCRIPTION
$V_{i\ VIF1}$	1	VIF differential input signal voltage 1
$V_{i\ VIF2}$	2	VIF differential input signal voltage 2
TADJ	3	tuner AGC takeover point adjust
$T_{PLL}$	4	PLL loop filter
$C_{SAGC}$	5	SIF AGC capacitor
$V_{o\ AF}$	6	AM audio frequency output voltage
LSWI	7	L/L accent switch
STD	8	standard switch
$V_{o(vid)}$	9	composite video output voltage
$V_{o\ QSS}$	10	single reference QSS output voltage
MUTE	11	AM mute switch
$V_{o\ CVBS}$	12	CVBS output signal voltage

SYMBOL	PIN	DESCRIPTION
$V_{i(vid)}$	13	video buffer input voltage
LGATSWI	14	L/L accent gating switch
$C_{BL}$	15	black level detector
TAGC	16	tuner AGC output
AFC	17	AFC output
VCO1	18	VCO1 reference circuit for $2f_c$
VCO2	19	VCO2 reference circuit for $2f_c$
GND	20	ground
$C_{VAGC}$	21	VIF AGC capacitor
$V_P$	22	supply voltage
$V_{i\ SIF1}$	23	SIF differential input signal voltage 1
$V_{i\ SIF2}$	24	SIF differential input signal voltage 2



## FEATURE BOX MODULE BLOCK DIAGRAM



## VPC323XD

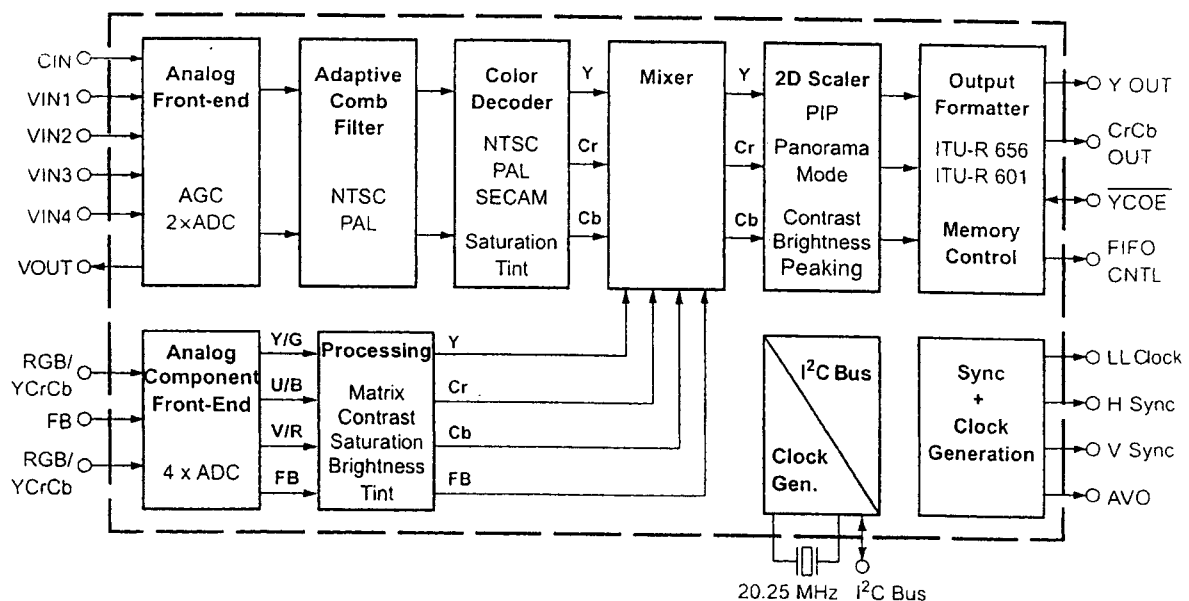
## Comb Filter Video Processor

### Introduction

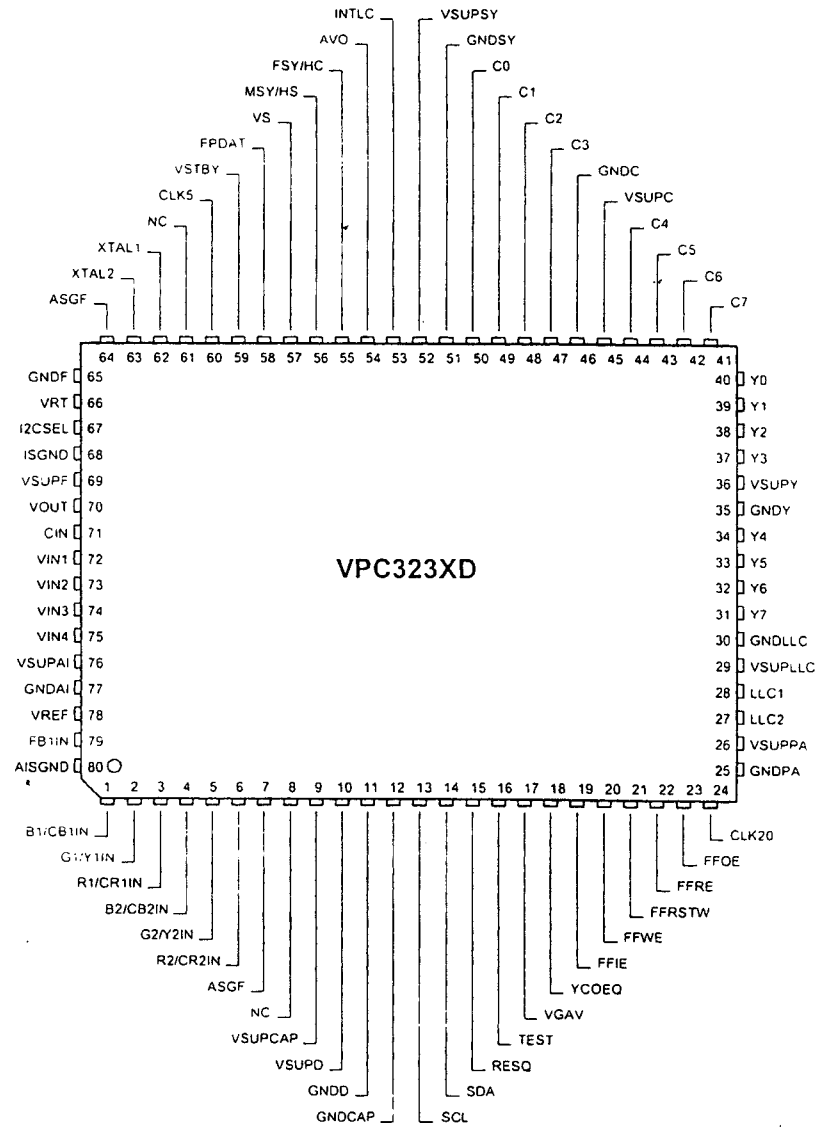
The VPC 323xD/324xD is a high-quality, single-chip video front-end, which is targeted for 4:3 and 16:9, 50/60 and 100/120 Hz TV sets. It can be combined with other members of the DIGIT3000 IC family (such as DDP 33x0A/B, TPU 3040) and/or it can be used with 3rd-party products.

The main features of the VPC 323xD/324xD are

- high-performance adaptive 4H comb filter Y/C separator with adjustable vertical peaking
- multi-standard color decoder PAL/NTSC/SECAM including all substandards
- four CVBS, one S-VHS input, one CVBS output
- two RGB/YC<sub>r</sub>C<sub>b</sub> component inputs, one Fast Blank (FB) input
- integrated high-quality A/D converters and associated clamp and AGC circuits
- multi-standard sync processing
- linear horizontal scaling (0.25 ... 4), as well as non-linear horizontal scaling 'panorama vision'
- PAL+ preprocessing (VPC 323xD)
- line-locked clock, data and sync, or 656-output interface (VPC 323xD)
- display and deflection control (VPC 324xD)
- peaking, contrast, brightness, color saturation and tint for RGB/YC<sub>r</sub>C<sub>b</sub> and CVBS/S-VHS
- high-quality soft mixer controlled by Fast Blank
- PIP processing for four picture sizes ( $\frac{1}{4}$ ,  $\frac{1}{9}$ ,  $\frac{1}{16}$  or  $\frac{1}{36}$  of normal size) with 8 bit resolution
- 15 predefined PIP display configurations and expert mode (fully programmable)
- control interface for external field memory
- I<sup>2</sup>C-Bus Interface
- one 20.25 MHz crystal, few external components
- 80-pin PQFP package



## Pin Configuration



## DDP 3310B

## Display and Deflection Processor

### Introduction

The DDP 3310B is a single-chip digital Display and Deflection Processor designed for high-quality back-end applications in 100/120-Hz TV sets with 4:3- or 16:9 picture tubes. The IC can be combined with members of the DIGIT 3000 IC family (VPC 32xx, TPU 3040), or it can be used with third-party products. The IC contains the entire digital video component and deflection processing and all analog interface components.

### Main Features

#### Video processing

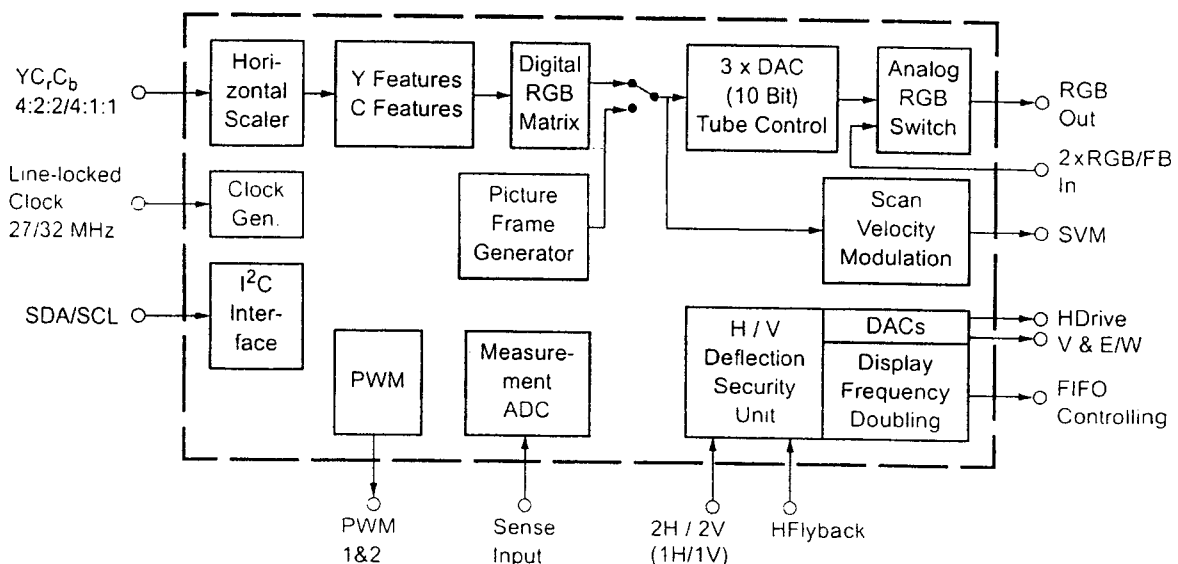
- linear horizontal scaling (0.25 ... 4)
- non-linear horizontal scaling "panoramavision"
- dynamic peaking
- soft limiter (gamma correction)
- color transient improvement
- programmable RGB matrix
- picture frame generator
- two analog RGB/Fast-Blank inputs

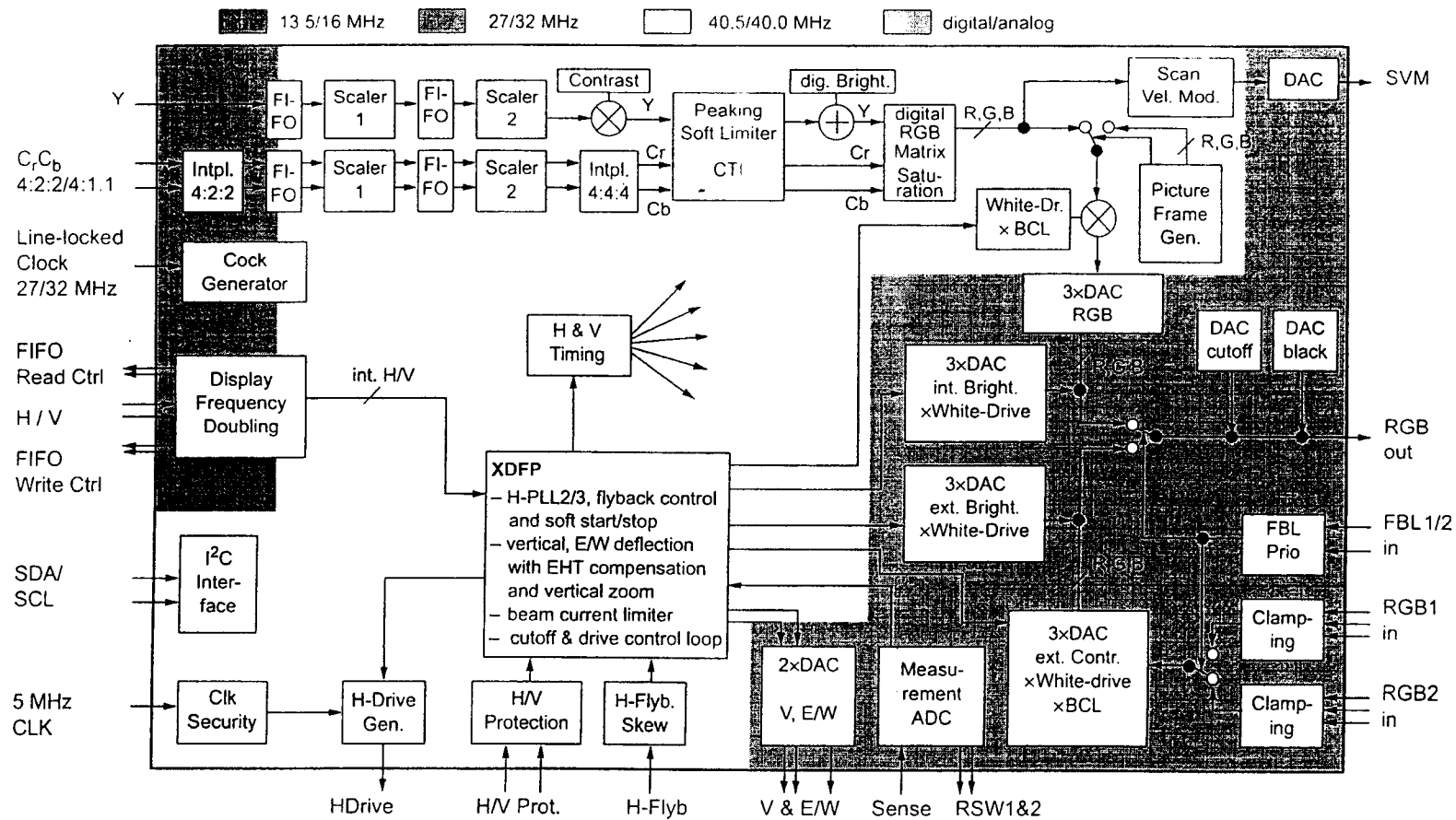
#### Deflection processing

- scan velocity modulation output
- high-performance H/V deflection
- EHT compensation for vertical / East/West
- soft start/stop of H-Drive
- vertical angle and bow
- differential vertical output
- vertical zoom via deflection
- horizontal and vertical protection circuit
- adjustable horizontal frequency for VGA/SVGA display

#### Miscellaneous

- selectable 4:1:1/4:2:2 YC<sub>r</sub>C<sub>b</sub> input
- selectable 27/32-MHz line-locked clock input
- crystal oscillator for horizontal protection
- automatic picture tube adjustment (cutoff, white-drive)
- single 5-V power supply
- hardware for simple 50/60-Hz to 100/120-Hz conversion (display frequency doubling)
- two I<sup>2</sup>C-controlled PWM outputs
- beam current limiter







## SDA 9401

### General description

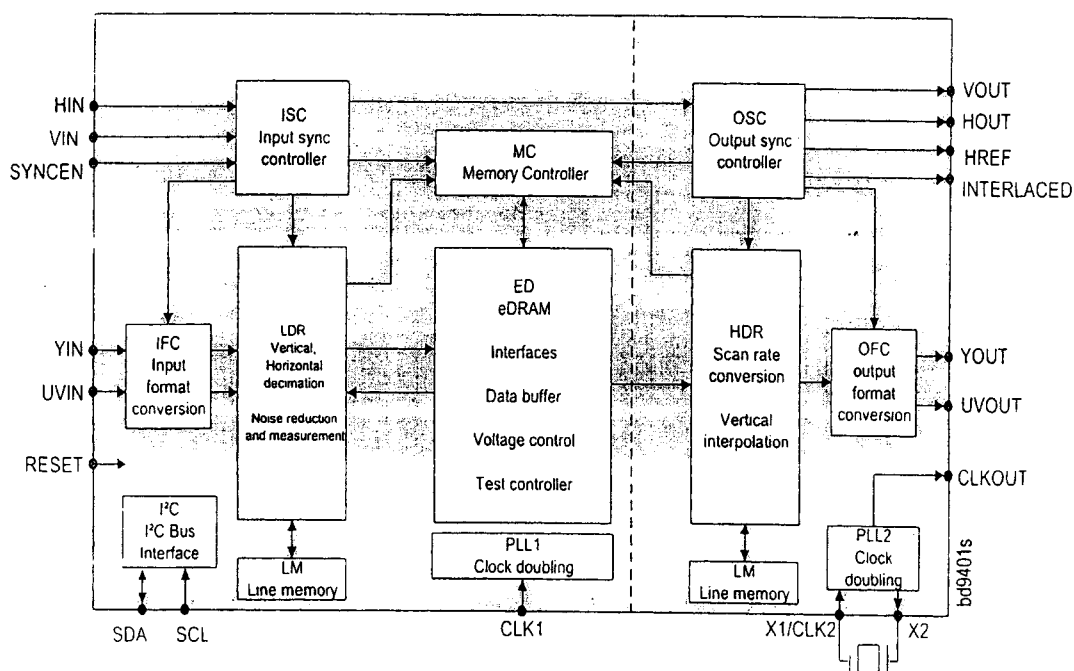
The SDA 9401 is pin compatible to the SDA 9400 (frame memory embedded).  
The SDA 9401 comprises all main functionalities of a digital featurebox in one monolithic IC.

The SDA 9401 does a simple 100/120 Hz interlaced (50/60 Hz progressive) scan rate conversion. The scan rate converted picture can be vertically expanded. The SDA 9401 has a freerunning mode, therefore features like multiple picture display (e.g. tuner scan) are possible.

The noise reduction is field based. Furthermore separate motion detectors for luminance and chrominance have been implemented. For automatic controlling of the noise reduction parameters a noise measurement algorithm is included, which measures the noise level in the picture or in the blanking period. In addition a spatial noise reduction is implemented, which reduces the noise even in the case of motion. The input signal can be compressed horizontally and vertically with a certain number of factors. Therefore split screen modes are supported too.

Beside these additional functions like coloured background, windowing and flashing are implemented.

### Block diagram



- **Flexible clock and synchronization concept**
  - Decoupling of the input and output clock system possible
- **Scan rate conversion**
  - Simple 100/120 Hz interlaced scan conversion (e.g. AABB, AA\*B\*B)
  - Simple progressive scan conversion (e.g. AA\*)
- **Flexible digital vertical expansion of the output signal (1.0, ... [1/32] ... , 2.0)**
- **Flexible output sync controller**
  - Flexible positioning of the output signal
  - Flexible programming of the output sync raster
- **Signal manipulations**
  - Insertion of coloured background
  - Vertical and/or horizontal windowing with four different speed factors
  - Flash generation
  - Still field
  - Support of split screen applications
  - Multiple picture display - Tuner scan (4 and 16 times for 4:3, 12 times for 16:9 tubes)
  - Support of multi picture display with PIP or front-end processor with integrated scaler (e.g. 9 times display of PIP pictures, picture tracking, random pictures, still-in-moving picture, moving-in-still picture)
- **I<sup>2</sup>C-bus control (400 kHz)**
- **P-MQFP-64 package**
- **3.3 V ± 5% supply voltage**

## SERVICE ADJUSTMENTS

### Enter the service Mode :

You need the special remote control to enter and exit the service menü of the TV (You can supply it from manufacturer.) All buttons of service RC are same with user remote control , only service in/out key are added to the service remote control.

### IF Modüle Adjustment :

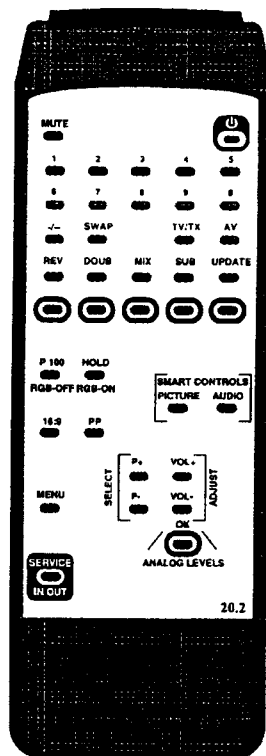
Apply a RF signal with amplitude  $65 \pm 1\text{dBuV}$  to the antenna input of TV from a pattern generator. (switch sound carrier to off and switch "Video ext" to on)  
Connect an oscilloscope to pin  $\neq 10$  (IF1) of Tuner and ground. Adjust the amplitude of signal  $600 \pm 20\text{mVpp}$  with P102 potantiometer.

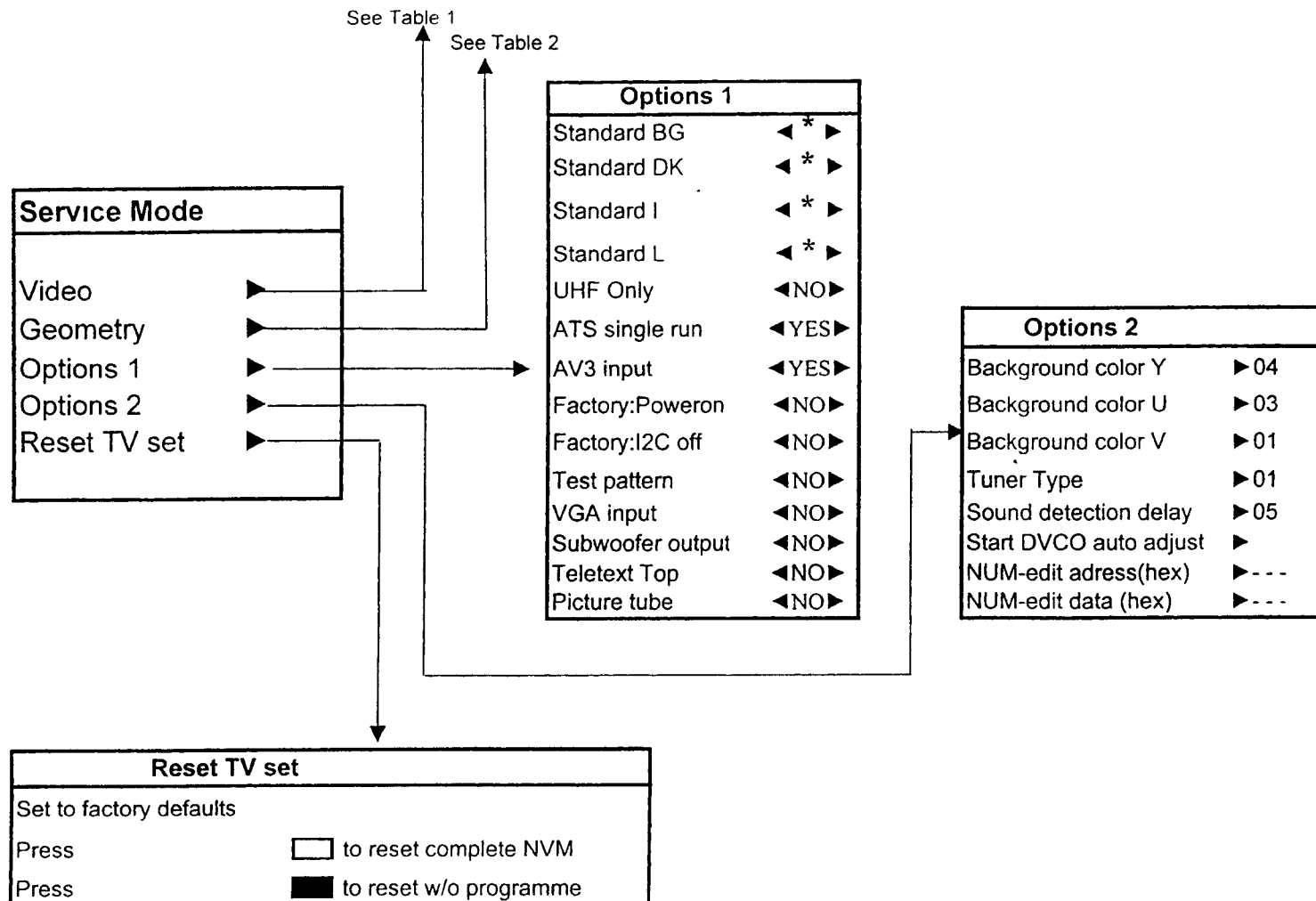
### Secreen Adjustment :

Enter the Service menü with service R/C and select "Video" submenü. In this option, select "HOLD" button. Screen will be blank and a line appears in the middle of screen. In this case, adjust the screen potentiometer to the level where the line is just visiable firstly.

### Geometry Adjustment :

- 20.2 chassis have two Geometry adjustment memories which are Geometry PAL and Geometry NTSC.
- Apply a signal with FUBK or Philips test pattern.
- Both PAL and NTSC geometry adjustments have to be completed for all versions.
- Adjust vertical width at " **V-size** ", vertical linearite at " **V-line** ", horizontal width at " **EW-width** ", general parabola at " **EW-Parabola** ", horizontal centering at " **H-shift** ", trapezium at " **EW- trapezium** ", Upper corner parabola at " **EW-Upper corner** ", lower corner parabola at " **EW-lower corner** ", " **BOW** " and " **S-correction** ".
- In service menü, do not adjust "NVM-edit adres (hex)", "NVM-edit data(hex) items and "Reset Tv set" subtitle. Reset TV set subtitle is releated and used for factory adjustments only.
- For NTSC geometry adjustment , apply a NTSC signal to scart 1 (AV1) from a pattern generator with FUBK or Philips test pattern. Enter the service menü and select "Geometry" submenü. In this case, the title of Geometry submenü is "Geometry (NTSC)" on screen.  
After geometry adjustments exit from service menü.





\* Depends on model and country

## 20.2 SERVICE SETUP

Service Mode	
Video	▶
Geometry	▶
Options 1	▶
Options 2	▶
Reset TV set	▶

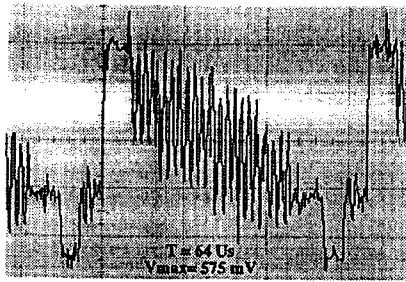
VIDEO	28inch	28inch 16/9 SUPER FLAT	28inch 16/9 PURE FLAT	29inch PURE FLAT	29inch SUPER FLAT	32inch SUPER FLAT	32inch PURE FLAT	33inch
Red Drive	▶015	019	019	019	019	019	019	019
Blue Drive	▶014	017	017	017	016	017	017	017
Green Drive	▶013	015	016	016	015	016	016	016
Red Cutoff	▶015	015	015	015	015	015	015	015
BlueCutoff	▶014	014	014	013	014	014	014	014
Green Cutoff	▶013	013	013	013	013	013	013	013
BCLThreshold	▶+007	+007	+006	+008	+007	+008	+008	+008
YC-Delay	▶000	000	000	000	000	000	000	000
Horizontal OSD Pos.	▶-024	-024	-024	-024	-024	-024	-024	-024
Vertical OSD pos.	▶+004	+004	+004	+004	+004	+004	+004	+004

Table 1

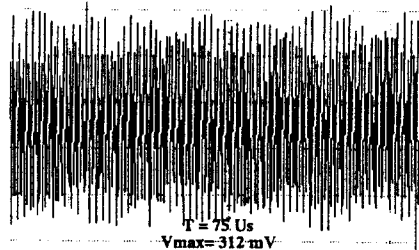
Geometry	28inch	28inch 16/9 SUPER FLAT	28inch 16/9 PURE FLAT	29inch PURE FLAT	29inch SUPER FLAT	32inch SUPER FLAT	32inch PURE FLAT	33inch
V-Size	▶-043	-005	+002	-018	-052	-065	-032	-043
V-Shift	▶+001	+003	+001	-002	-001	+002	000	+001
V-Lin	▶000	000	000	000	000	000	000	000
S-Correction	▶+040	+028	+028	+040	+040	+028	+028	+040
EW-Width	▶+028	+053	+060	+042	+060	+064	+058	+028
EW-Parabola	▶-062	-049	-048	-053	-052	-047	-043	-062
H-Shift	▶-004	-003	+001	+001	-005	+001	-004	-004
EW-Trapezium	▶-011	-003	-009	-013	-005	-008	-014	-011
EW-Upper Corner	▶+014	+010	+007	+009	+015	+007	+001	+014
EW-Lower Corner	▶+020	+013	+011	+021	+021	+011	+012	+020
Hor;EHT	▶-025	-025	-025	-025	-025	-025	-025	-025
Vert,EHT	▶-020	-020	-020	-020	-020	-020	-020	-020
Bow	▶000	000	000	000	000	000	000	000

Table 2

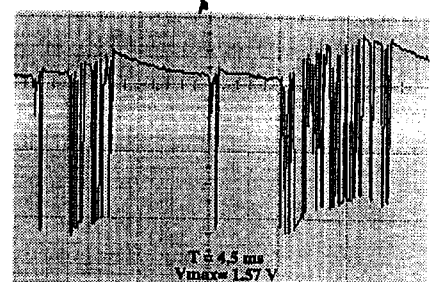
## WAVE FORMS



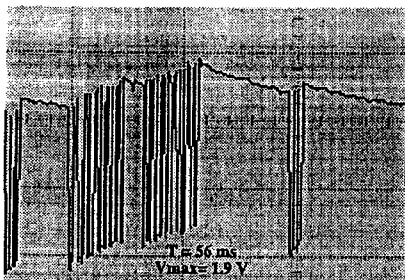
CVBS  
CN 703A PIN 2



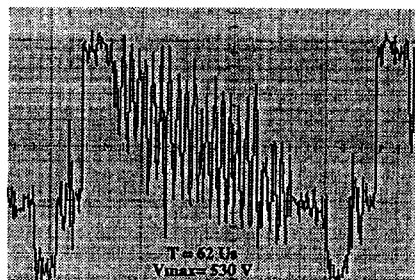
QSS  
CN 703A PIN 1



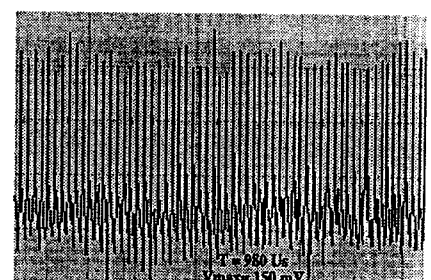
SCL  
CN 703A PIN 7



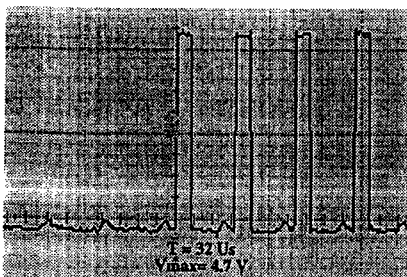
SDA  
CN 703A PIN 8



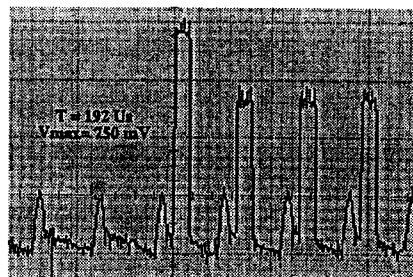
CVBS FB  
CN 703A PIN 16



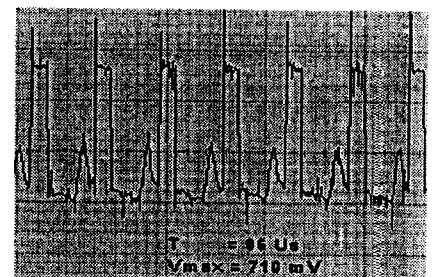
IF 2  
TUNER PIN 11



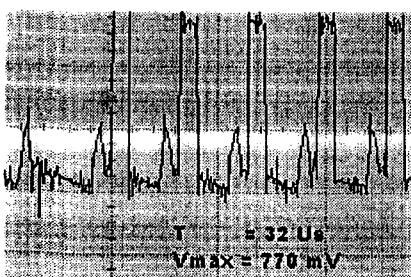
OSD BL  
CN 501A PIN 4



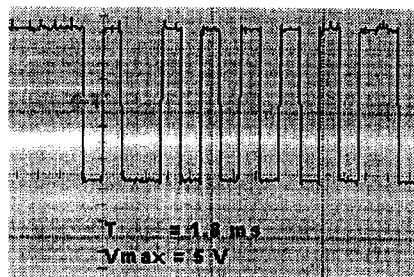
OSD B  
CN 501A PIN 3



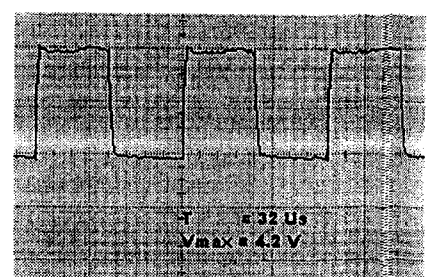
OSD G  
CN 501A PIN 2



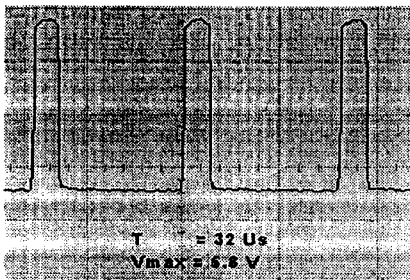
OSD R  
CN 501A PIN 1



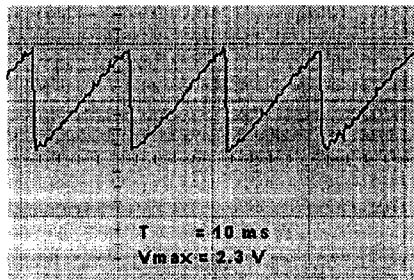
IR LED  
CN 502A PIN 7



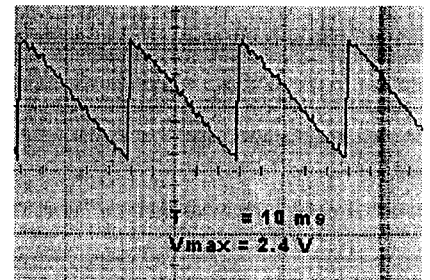
H Drive  
CN 802A PIN 8



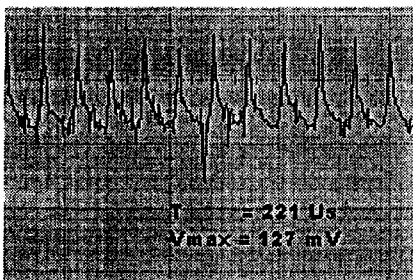
PH12  
CN 802A PIN 7



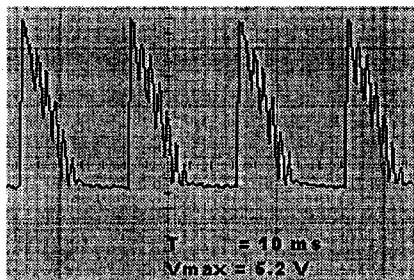
V Drive (-)  
CN 802A PIN5



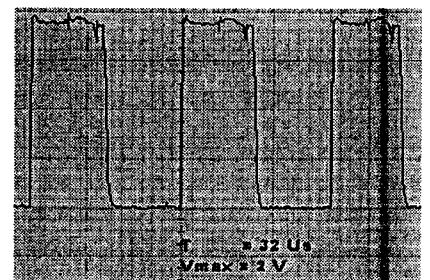
V Drive (+)  
CN 802A PIN 4



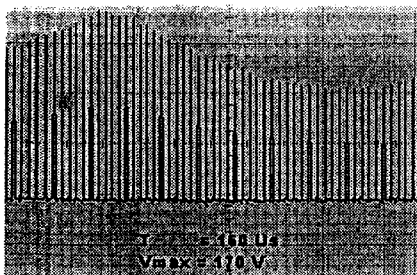
E/W  
CN 802A PIN 2



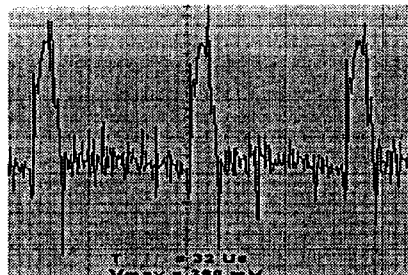
V PROT  
CN 802A PIN 6



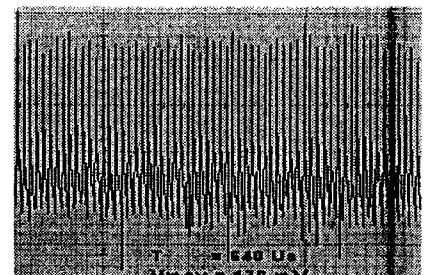
H Drive  
Q203 Gate



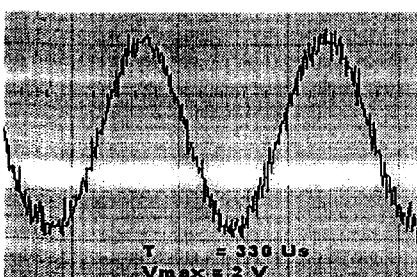
VERT.OUT  
D207 Katot



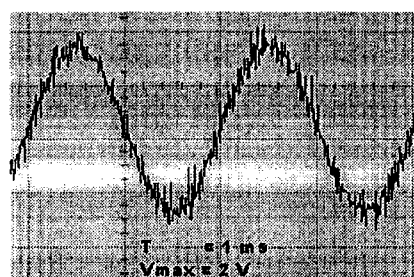
HEATER  
CRT X902 PIN 2



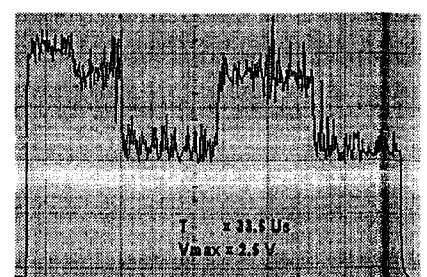
IF 2  
TUNER PIN 10



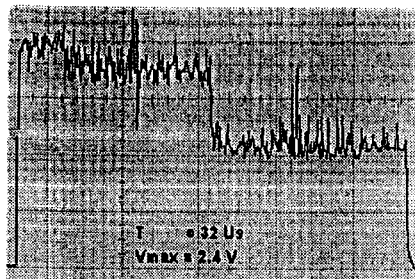
L OUT  
CN 701A PIN 5



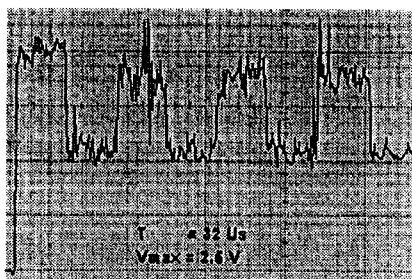
R OUT  
CN 701A PIN 6



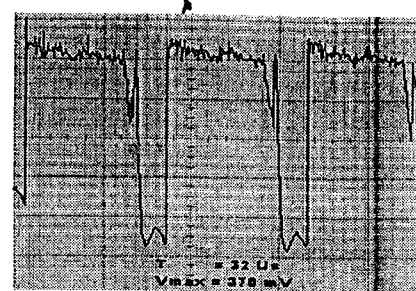
RED  
CRT X901 PIN 1



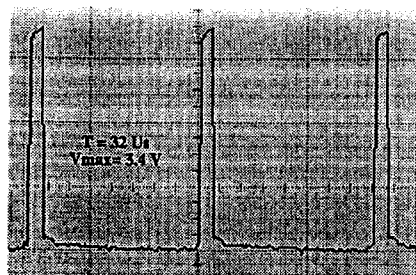
GREEN  
CRT X901 PIN 2



BLUE  
CRT X901 PIN 3



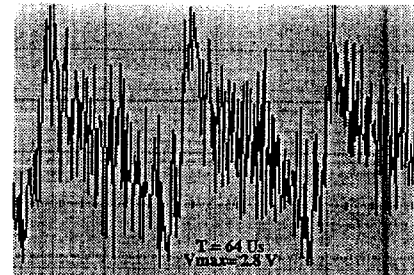
CUT OFF  
CRT X901 PIN 4



HS2  
CN 501A PIN 11



VS2  
CN 501A PIN 12



CVBS TTX  
CN 501A PIN 13



# CHANNEL TABLE FOR STANDARD B/G (CCIR)

Channel number (display)	Channel design.	Centre frequency (MHz)	Oscillator frequency (MHz)	Division ratio PLL (decimal)	Channel number (display)	Channel design.	Centre frequency (MHz)	Oscillator frequency (MHz)	Division ratio PLL (decimal)
C01	AU 0	46.25	85.125	1.362	C61	K61	791.25	830.125	13.282
C02	K2	483.25	87.125	1.394	C62	K62	799.25	838.125	13.410
C03	K3	55.25	94.125	1.506	C63	K63	807.25	846.125	13.538
C04	K4	62.25	101.125	1.618	C64	K64	815.25	854.125	13.666
C05	K5	1753.25	214.125	3.426	C65	K65	823.25	862.125	13.794
C06	K6	182.25	221.125	3.538	C66	K66	831.25	870.125	13.922
C07	K7	189.25	228.125	3.650	C67	K67	839.25	878.125	14.050
C08	K8	196.25	235.125	3.762	C68	K68	847.25	886.125	14.178
C09	K9	203.25	252.125	3.874	C69	K69	855.25	894.125	14.306
C10	K10	210.25	249.125	3.986	C70	EX	863.25	902.125	14.434
C11	K11	217.25	256.125	4.098	C71	EX	871.25	910.125	14.562
C12	K12	224.25	263.125	4.210	C72	EX	879.25	918.125	14.690
C13	A	23.75	92.625	1.482	C73	EX	887.25	926.125	14.818
C14	B	62.25	101.125	1.618	C74	EX	69.25	108.125	1.730
C15	C	82.25	121.125	1.938	C75	EX	76.25	115.125	1.842
C16	D	175.25	214.125	3.426	C76	EX	83.25	122.125	1.954
C17	E	183.75	222.625	3.562	C77	EX	90.25	129.125	2.066
C18	F	192.25	231.125	3.698	C78	EX	97.25	136.125	2.178
C19	G	201.25	240.125	3.842	C79	201	59.25	98.125	1.570
C20	H	210.25	249.125	3.986	C80	S01	93.25	132.125	2.114
C21	K21	475.25	510.125	8.162	S01	S1	105.25	144.125	2.306
C22	K22	479.25	518.125	8.290	S02	S2	112.25	151.125	2.418
C23	K23	487.25	526.125	8.418	S03	S3	119.25	158.125	2.530
C24	K24	495.25	534.125	8.546	S04	S4	126.25	165.125	2.642
C25	K25	503.25	542.125	8.674	S05	S5	133.25	172.125	2.754
C26	K26	511.25	550.125	8.802	S06	S6	140.25	179.125	2.866
C27	K27	519.25	558.125	8.930	S07	S7	147.25	186.125	2.978
C28	K28	527.25	566.125	9.058	S08	S8	154.25	193.125	3.090
C29	K20	535.25	574.125	9.186	S09	S9	161.25	200.125	3.202
C30	R30	543.25	582.125	9.314	S10	S10	168.25	207.125	3.314
C31	R31	551.25	590.125	9.442	S11	S11	231.25	270.125	4.322
C32	K32	559.25	598.125	9.570	S12	S12	238.25	277.125	4.434
C33	K33	567.25	606.125	9.698	S13	S13	245.25	284.125	4.546
C34	K34	575.25	614.125	9.826	S14	S14	252.25	291.125	4.658
C35	K35	583.25	622.125	9.954	S15	S15	259.25	298.125	4.770
C36	K36	591.25	630.125	10.082	S16	S16	266.25	305.125	4.882
C37	K37	599.25	638.125	10.210	S17	S17	273.25	312.125	4.994
C38	K38	607.25	646.125	10.338	S18	S18	280.25	319.125	5.106
C39	K39	615.25	654.125	10.466	S19	S19	287.25	326.125	5.218
C40	K40	623.25	662.125	10.594	S20	S20	294.25	333.125	5.330
C41	K41	631.25	670.125	10.722	S21	S21	303.25	342.125	5.474
C42	K42	639.25	678.125	10.850	S22	S22	311.25	350.125	5.602
C43	K43	647.25	686.125	10.978	S23	S23	319.25	358.125	5.730
C44	K44	655.25	694.125	11.106	S24	S24	327.25	366.125	5.858
C45	K45	663.25	702.125	11.234	S25	S25	335.25	374.125	5.986
C46	K46	671.25	710.125	11.362	S26	S26	343.25	382.125	6.050
C47	K47	679.25	718.125	11.490	S27	S27	351.25	390.125	6.242
C48	K48	687.25	726.125	11.618	S28	S28	359.25	398.125	6.370
C49	K49	695.25	734.125	11.746	S29	S29	367.25	406.125	6.498
C50	K50	703.25	742.125	11.874	S30	S30	375.25	414.125	6.626
C51	K51	711.25	750.125	12.002	S31	S31	383.25	422.125	6.754
C52	K52	719.25	758.125	12.130	S32	S32	391.25	430.125	6.882
C53	K53	727.25	766.125	12.258	S33	S33	399.25	438.125	7.010
C54	K54	735.25	774.125	12.386	S34	S34	407.25	446.125	7.138
C55	K55	743.25	782.125	12.514	S35	S35	415.25	454.125	7.266
C56	K56	751.25	790.125	12.642	S36	S36	423.25	462.125	7.394
C57	K57	759.25	798.125	12.770	S37	S37	431.25	470.125	7.522
C58	K58	767.25	806.125	12.898	S38	S38	439.25	478.125	7.650
C59	K59	775.25	814.125	13.026	S39	S39	447.25	486.125	7.778
C60	K60	783.25	822.125	13.154	S40	S40	455.25	494.125	7.906
					S41	S41	463.25	502.125	8.034

# CHANNEL FOR STANDARD I+

Channel number (display)	Channel design.	Centre frequency (MHz)	Oscillator frequency (MHz)	Division ratio PLL (decimal)	Channel number (display)	Channel design.	Centre frequency (MHz)	Oscillator frequency (MHz)	Division ratio PLL (decimal)
C01	R1	49.75	88.625	1.362	C61	R61	791.25	830.125	13.282
C02	R2	59.25	98.125	1.570	C62	R62	799.25	838.125	13.410
C03	R3	77.25	116.125	1.858	C63	R63	807.25	846.125	13.538
C04	R4	85.25	124.125	1.986	C64	R64	815.25	854.125	13.666
C05	R5	93.25	132.125	2.114	C55	R65	823.25	862.125	13.794
C06	R6	175.25	214.125	3.426	C66	R66	831.25	870.125	13.922
C07	R7	183.25	222.625	3.554	C67	R67	839.25	878.125	14.050
C08	R8	191.25	230.125	3.682	C68	R68	847.25	886.125	14.178
C09	R9	199.25	238.125	3.810	C69	R69	855.25	894.125	14.306
C10	R10	207.25	246.125	3.938	C70	170	863.25	902.125	14.434
C11	R11	215.25	254.125	4.066	C71	171	871.25	910.125	14.562
C12	R12	223.25	262.125	4.194	C72	172	879.25	918.125	14.690
C21	R21	471.25	510.125	8.162	C73	173	887.25	926.125	14.818
C22	R22	469.25	518.125	8.290	S01	S1	103.25	142.125	2.274
C23	R23	487.25	526.125	8.418	S02	S2	111.25	150.125	2.402
C24	R24	495.25	534.125	8.546	S03	S3	119.25	158.125	2.530
C25	R25	503.25	542.125	8.674	S04	S4	127.25	166.125	2.658
C26	R26	511.25	550.125	8.802	S05	S5	135.25	174.125	2.786
C27	R27	519.25	558.125	8.930	S06	S6	143.25	182.125	2.914
C28	R28	527.25	566.125	9.058	S07	S7	151.25	190.125	3.042
C29	R29	535.25	574.125	9.186	S08	S8	159.25	198.125	3.170
C30	R30	543.25	582.125	9.314	S09	S9	167.25	206.125	3.298
C31	R31	551.25	590.125	9.442	S10	S10	231.25	270.125	4.322
C32	R32	559.25	598.125	9.570	S11	S11	239.25	278.125	4.450
C33	R33	567.25	606.125	9.698	S12	S12	247.25	286.125	4.578
C34	R34	575.25	614.125	9.826	S13	S13	255.25	294.125	4.706
C35	R35	583.25	622.125	9.954	S14	S14	263.25	302.125	4.834
C36	R36	591.25	630.125	10.082	S15	S15	271.25	310.125	4.962
C37	R37	599.25	638.125	10.210	S16	S16	279.25	318.125	5.090
C38	R38	607.25	646.125	10.338	S17	S17	287.25	326.125	5.218
C39	R39	615.25	654.125	10.466	S18	S18	295.25	334.125	5.346
C40	R40	623.25	662.125	10.594	S19	S19	303.25	342.125	5.474
C41	R41	631.25	670.125	10.722	S11	S11	311.25	350.125	5.602
C42	R42	639.25	678.125	10.850	S23	S23	319.25	358.125	5.730
C43	R43	647.25	686.125	10.978	S24	S24	327.25	366.125	5.858
C44	R44	655.25	694.125	11.106	S25	S25	335.25	374.125	5.986
C45	R45	663.25	702.125	11.234	S26	S26	343.25	382.125	6.050
C46	R46	671.25	710.125	11.362	S27	S27	351.25	390.125	6.242
C47	R47	679.25	718.125	11.490	S28	S28	359.25	398.125	6.370
C48	R48	687.25	726.125	11.618	S29	S29	367.25	406.125	6.498
C49	R49	695.25	734.125	11.746	S30	S30	375.25	414.125	6.626
C50	R50	703.25	742.125	11.874	S31	S31	383.25	422.125	6.754
C51	R51	711.25	750.125	12.002	S32	S32	391.25	430.125	6.882
C52	R52	719.25	758.125	12.130	S33	S33	399.25	438.125	7.010
C53	R53	727.25	766.125	12.258	S34	S34	407.25	446.125	7.138
C54	R54	735.25	774.125	12.386	S35	S35	415.25	454.125	7.266
C55	R55	743.25	782.125	12.514	S36	S36	423.25	462.125	7.394
C56	R56	751.25	790.125	12.642	S37	S37	431.25	470.125	7.522
C57	R57	759.25	798.125	12.770	S38	S38	439.25	478.125	7.650
C58	R58	767.25	806.125	12.898	S39	S39	447.25	486.125	7.778
C59	R59	775.25	814.125	13.026	S40	S40	455.25	494.125	7.906
C60	R60	783.25	822.125	13.154	S41	S41	463.25	502.125	8.034

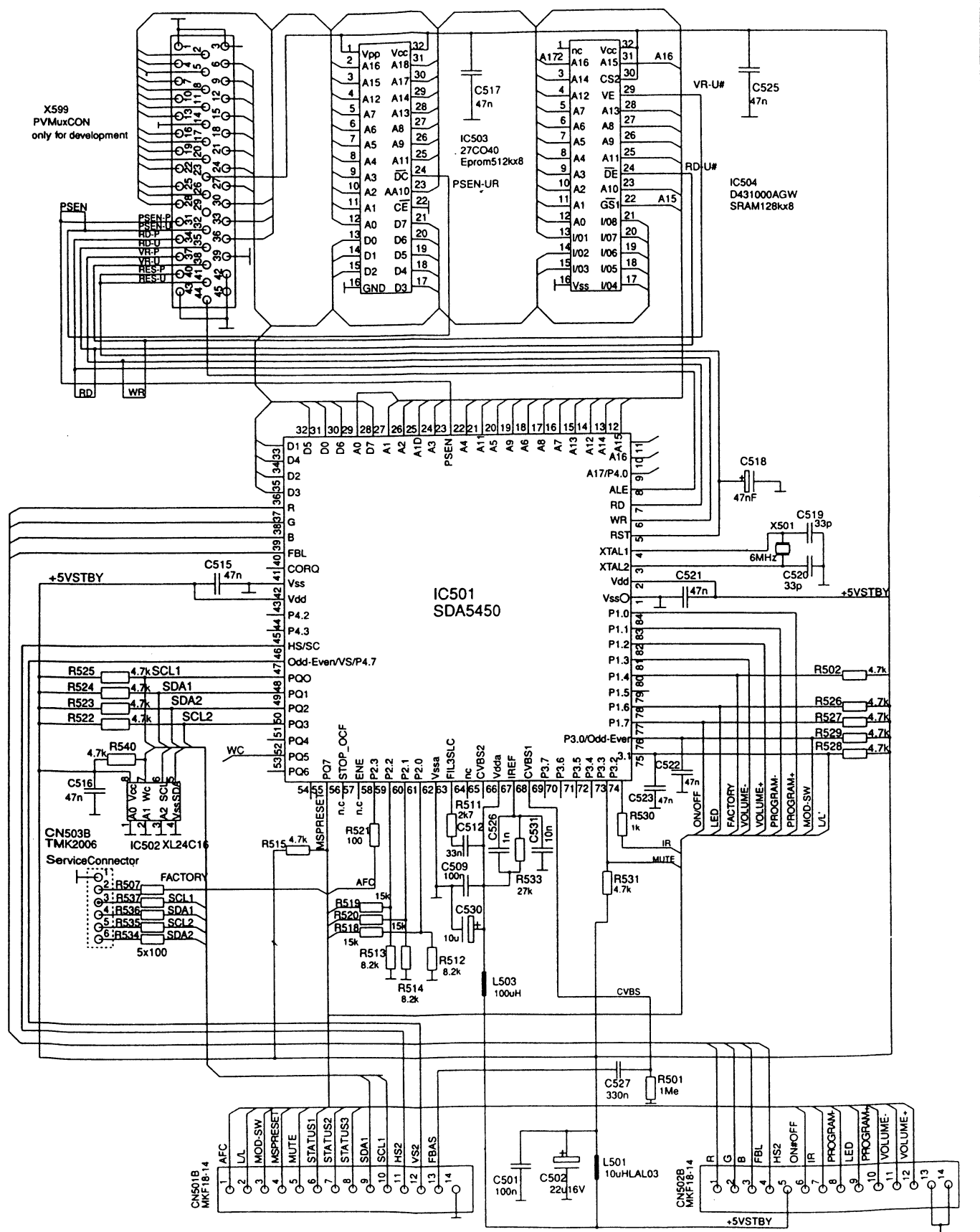
# CHANNEL FOR STANDARD D/K (OIRT)

Channel number (display)	Channel design.	Centre frequency (MHz)	Oscillator frequency (MHz)	Division ratio PLL (decimal)	Channel number (display)	Channel design.	Centre frequency (MHz)	Oscillator frequency (MHz)	Division ratio PLL (decimal)
C01	R1	49.75	88.625	1.418	C61	R61	791.25	830.125	13.262
C02	R2	59.25	98.125	1.570	C62	R62	799.25	838.125	13.410
C03	R3	77.25	116.125	1.858	C63	R63	807.25	846.125	13.538
C04	R4	85.25	124.125	1.986	C64	R64	815.25	854.125	13.666
C05	R5	93.25	132.125	2.114	C65	R65	823.25	862.125	13.794
C06	R6	175.25	214.125	3.426	C66	R66	831.25	870.125	13.922
C07	R7	183.25	222.625	3.554	C67	R67	839.25	878.125	14.050
C08	R8	191.25	230.125	3.682	C68	R68	847.25	886.125	14.178
C09	R9	199.25	238.125	3.810	C69	R69	855.25	894.125	14.306
C10	R10	207.25	246.125	3.938	S01	S1	103.25	142.125	2.274
C11	R11	215.25	254.125	4.066	S02	S2	111.25	150.125	2.402
C12	R12	223.25	262.125	4.194	S03	S3	119.25	158.125	2.530
C21	R21	471.25	510.125	8.162	S04	S4	127.25	166.125	2.658
C22	R22	479.25	518.125	8.290	S05	S5	135.25	174.125	2.786
C23	R23	487.25	526.125	8.418	S06	S6	143.25	182.125	2.914
C24	R24	495.25	534.125	8.546	S07	S7	151.25	190.125	3.042
C25	R25	503.25	542.125	8.674	S08	S8	159.25	198.125	3.170
C26	R26	511.25	550.125	8.802	S09	S9	167.25	206.125	3.298
C27	R27	519.25	558.125	8.930	S10	S10	231.25	270.125	4.322
C28	R28	527.25	566.125	9.058	S11	S11	239.25	278.125	4.450
C29	R29	535.25	574.125	9.186	S12	S12	247.25	286.125	4.578
C30	R30	543.25	582.125	9.314	S13	S13	255.25	294.125	4.706
C31	R31	551.25	590.125	9.442	S14	S14	263.25	302.125	4.834
C32	R32	559.25	598.125	9.570	S15	S15	271.25	310.125	4.962
C33	R33	567.25	606.125	9.698	S16	S16	279.25	318.125	5.090
C34	R34	575.25	614.125	9.826	S17	S17	287.25	325.125	5.218
C35	R35	583.25	622.125	9.954	S18	S18	295.25	334.125	5.346
C36	R36	591.25	630.125	10.082	S19	S19	303.25	342.125	5.474
C37	R37	599.25	638.125	10.210	S22	S22	311.25	350.125	5.602
C38	R38	607.25	646.125	10.338	S23	S23	319.25	358.125	5.730
C39	R39	615.25	654.125	10.466	S24	S24	327.25	366.125	5.858
C40	R40	623.25	662.125	10.594	S25	S25	335.25	374.125	5.986
C41	R41	631.25	670.125	10.722	S26	S26	343.25	382.125	6.050
C42	R42	639.25	678.125	10.850	S27	S27	351.25	390.125	6.242
C43	R43	647.25	686.125	10.978	S28	S28	359.25	398.125	6.370
C44	R44	655.25	694.125	11.106	S29	S29	367.25	406.125	6.498
C45	R45	663.25	702.125	11.234	S30	S30	375.25	414.125	6.626
C46	R46	671.25	710.125	11.362	S31	S31	383.25	422.125	6.754
C47	R47	679.25	718.125	11.490	S32	S32	391.25	430.125	6.882
C48	R48	687.25	726.125	11.618	S33	S33	399.25	438.125	7.010
C49	R49	695.25	734.125	11.746	S34	S34	407.25	446.125	7.138
C50	R50	703.25	742.125	11.874	S35	S35	415.25	454.125	7.266
C51	R51	711.25	750.125	12.002	S36	S36	423.25	462.125	7.394
C52	R52	719.25	758.125	12.130	S37	S37	431.25	470.125	7.522
C53	R53	727.25	766.125	12.258	S38	S38	439.25	478.125	7.650
C54	R54	735.25	774.125	12.386	S39	S39	447.25	486.125	7.778
C55	R55	743.25	782.125	12.514	S40	S40	455.25	494.125	7.906
C56	R56	751.25	790.125	12.642	S41	S41	463.25	502.125	8.034
C57	R57	759.25	798.125	12.770					
C58	R58	767.25	806.125	12.898					
C59	R59	775.25	814.125	13.026					
C60	R60	783.25	822.125	13.154					
C61	K61	791.25	830.125	13.282					
C62	K62	799.25	838.125	13.410					
C63	K63	807.25	846.125	13.538					
C64	K64	815.25	854.125	13.666					
C65	K65	823.25	862.125	13.794					

# CHANNEL TABLE FOR STANDARD L

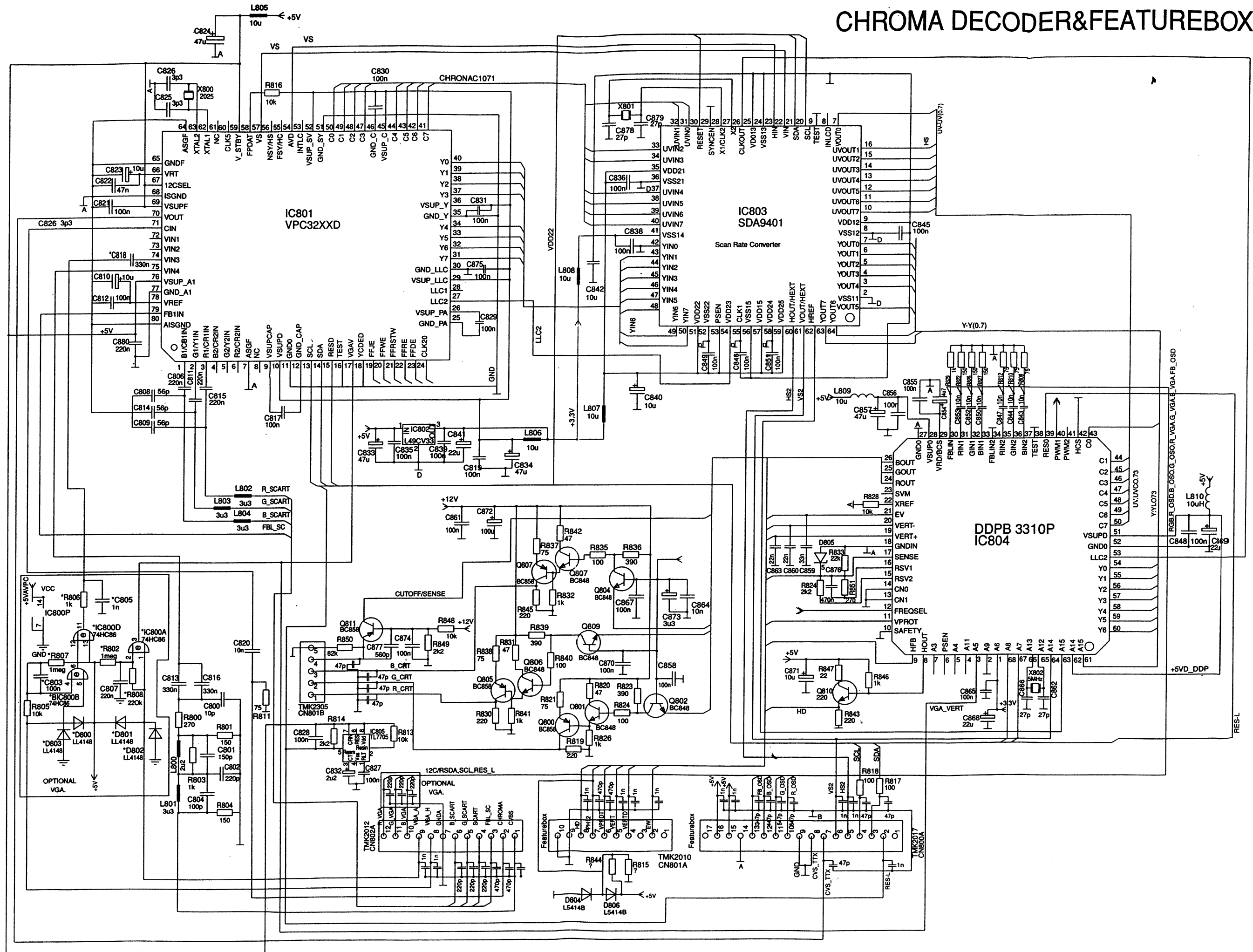
Channel number (display)	Channel design.	Centre frequency (MHz)	Oscillator frequency (MHz)	Division ratio PLL (decimal)	Channel number (display)	Channel design.	Centre frequency (MHz)	Oscillator frequency (MHz)	Division ratio PLL (decimal)
C02	L2	55.75	90.125	1.442	C61	K61	791.25	830.125	13.282
C03	L3	60.50	94.875	1.518	C62	K62	799.25	838.125	13.410
C04	L4	63.75	98.125	1.570	C63	K63	807.25	846.125	13.538
C05	L5	176.00	214.875	3.438	C64	K64	815.25	854.125	13.666
					C55	K65	823.25	862.125	13.794
C06	L6	184.00	222.875	3.566					
C07	L7	192.00	230.875	3.694	C66	K66	831.25	870.125	13.922
C08	L8	200.00	238.875	3.822	C67	K67	839.25	878.125	14.050
C09	L9	208.00	246.875	3.950	C68	K68	847.25	886.125	14.178
C10	L10	216.00	254.875	4.078	C69	K69	855.25	894.125	14.306
					C70	EX	863.25	902.125	14.434
C11	LUX	189.25	228.125	3.650					
					S01	B	116.75	155.625	2.490
C12	K6	182.25	221.125	3.538	S02	C	128.75	167.625	2.682
C13	K8	196.25	235.125	3.762	S03	D	140.75	179.625	2.874
C14	K10	210.25	249.125	3.986	S04	E	152.75	191.625	3.066
					S05	F	164.75	203.625	3.258
C21	K21	471.25	510.125	8.162					
C22	K22	479.25	518.125	8.290	S06	G	176.75	215.625	3.450
C23	K23	487.25	526.125	8.418	S07	S	188.75	227.625	3.642
C24	K24	495.25	534.125	8.546	S08	I	200.75	239.625	3.834
C25	K25	503.25	543.025	8.674	S09	J	212.75	251.625	4.026
					S10	K	224.75	263.625	4.218
C26	K26	511.25	550.125	8.802					
C27	K27	519.25	558.125	8.930	S11	L	236.75	275.625	4.410
C28	K28	527.25	566.125	9.058	S12	M	248.75	287.625	4.602
C29	K29	535.25	574.125	9.186	S13	N	260.75	299.625	4.794
C30	K30	543.25	583.025	9.314	S14	O	272.75	311.625	4.986
					S15	P	284.75	323.625	5.178
C31	K31	551.25	590.125	9.442	S16	Q	296.75	335.625	5.370
C32	K32	559.25	598.125	9.570					
C33	K33	567.25	606.125	9.698	S21	S21	303.25	343.025	5.474
C34	K34	575.25	614.125	9.826	S22	S22	311.25	350.125	5.602
C35	K35	583.25	623.025	9.954	S23	S23	319.25	358.125	5.730
					S24	S24	327.25	366.125	5.858
C36	K36	591.25	630.125	10.082	S25	S25	335.25	374.125	5.986
C37	K37	599.25	638.125	10.210					
C38	K38	607.25	646.125	10.338	S26	S26	343.25	383.025	6.050
C39	K39	615.25	654.125	10.466	S27	S27	351.25	390.125	6.242
					S28	S28	359.25	398.125	6.370
C40	K40	623.25	662.125	10.594	S29	S29	367.25	406.125	6.498
C41	K41	631.25	670.125	10.722	S30	S30	375.25	414.125	6.626
C42	K42	639.25	678.125	10.850					
C43	K43	647.25	686.125	10.978	S31	S31	383.25	423.025	6.754
C44	K44	655.25	694.125	11.106	S32	S32	391.25	430.125	6.882
					S33	S33	399.25	438.125	7.010
C45	K45	663.25	702.125	11.234	S34	S34	407.25	446.125	7.138
C46	K46	671.25	710.125	11.362	S35	S35	415.25	454.125	7.266
C47	K47	679.25	718.125	11.490	S36	S36	423.25	463.025	7.394
C48	K48	687.25	726.125	11.618					
C49	K49	695.25	734.125	11.746	S37	S37	431.25	470.125	7.522
C50	K50	703.25	742.125	11.874	S38	S38	439.25	478.125	7.650
					S39	S39	447.25	486.125	7.778
C51	K51	711.25	750.125	12.002	S40	S40	455.25	494.125	7.906
C52	K52	719.25	758.125	12.130	S41	S41	463.25	503.025	8.034
C53	K53	727.25	766.125	12.258					
C54	K54	735.25	774.125	12.386					
C55	K55	743.25	782.125	12.514					
C56	K56	751.25	790.125	12.642					
C57	K57	759.25	798.125	12.770					
C58	K58	767.25	806.125	12.898					
C59	K59	775.25	814.125	13.026					
C60	K60	783.25	822.125	13.154					

# MICRO PC MODUL

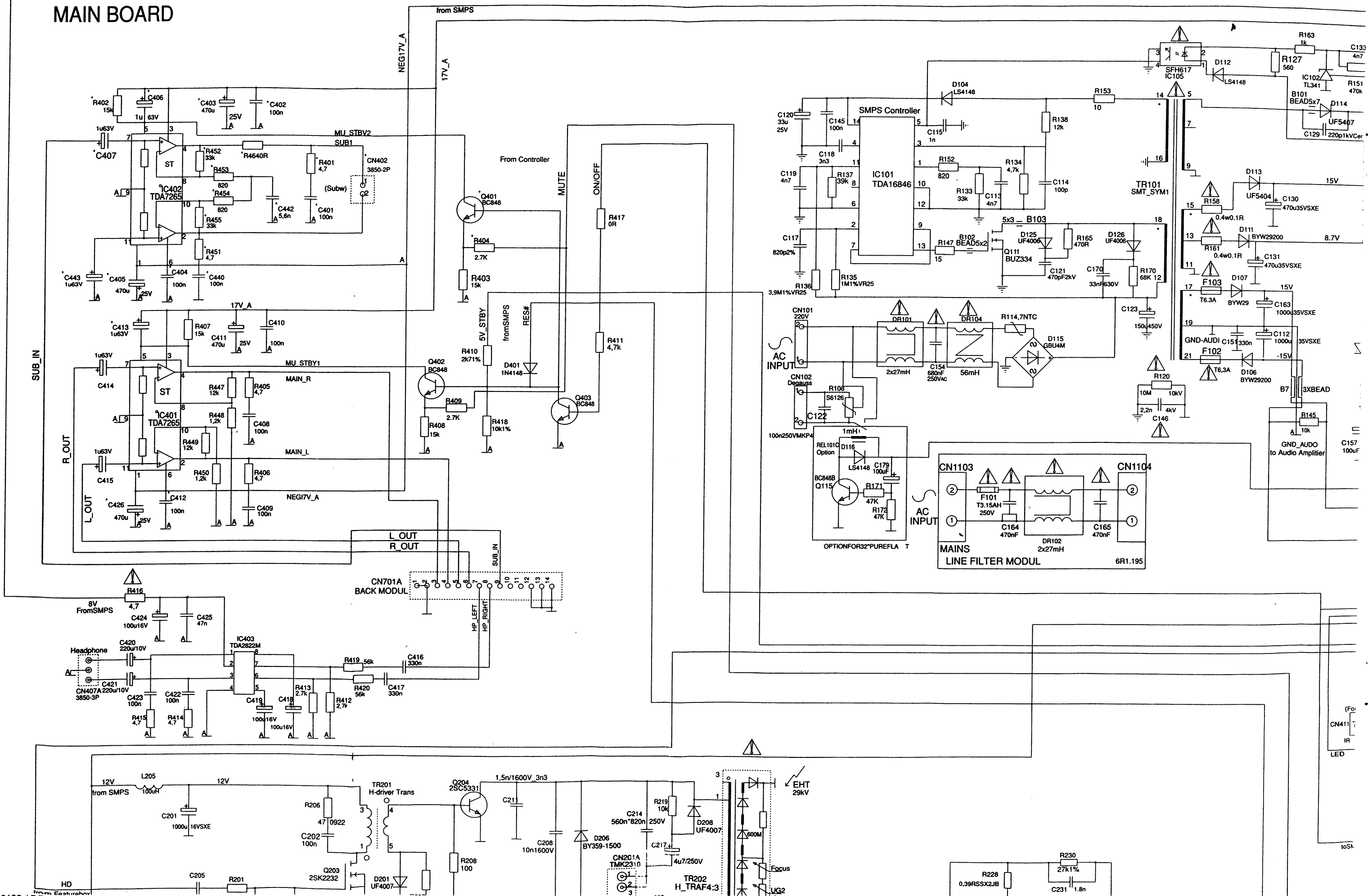




# CHROMA DECODER&FEATUREBOX



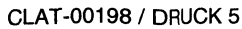
# MAIN BOARD











# STEREO/NICAM DECODER & SCART MODUL

